



# EVERY SOLDIER, EVERYWHERE, EVERY DAY

Program Executive Office Soldier Portfolio FY2009  
[peosoldier.army.mil](http://peosoldier.army.mil)



## To the Reader:



**U.S. ARMY**



We at Program Executive Office (PEO) Soldier are honored to serve our Soldiers. It is our duty to make sure that they have the best equipment available as they put their lives on the line defending freedom. We take that responsibility very seriously. Our Soldiers are more effective and better protected than ever—in even the most hostile environments—thanks to the clothing and equipment PEO Soldier develops, procures, and delivers to them.

PEO Soldier is responsible for virtually everything our Soldiers wear or carry, and Soldiers and their families can rest assured that each item has been rigorously tested to the Army's highest standards. The Portfolio for Fiscal Year 2009 includes detailed descriptions and specifications of most of our 400 products.

We carefully consider Soldiers' missions and the environments in which they serve as we continue to develop new and better gear. We treat the Soldier as a System by ensuring that individual pieces of equipment work together in an integrated manner. We have thus been able to reduce combat load and increase the comfort, mobility, and mission effectiveness of our Soldiers.

New in this year's Portfolio is a Soldier Science & Technology section, which outlines ongoing research and development efforts to make sure that our Soldiers remain the most capable and best-equipped force in history. We continue to work with defense, industry, and academic partners to push the envelope in Soldier technology. The best Soldiers in the world deserve nothing less.

A handwritten signature in black ink, reading "R. Mark Brown".

**R. Mark Brown**  
**Brigadier General, USA**  
**Program Executive Officer, Soldier**

**and Commanding General, U.S. Army Soldier Systems Center (SSC)**



**“The willingness with which our young people are likely to serve in any war, no matter how justified, shall be directly proportional as to how they perceive the veterans of earlier wars were treated and appreciated by their nation.”**

**—George Washington**

# Soldier

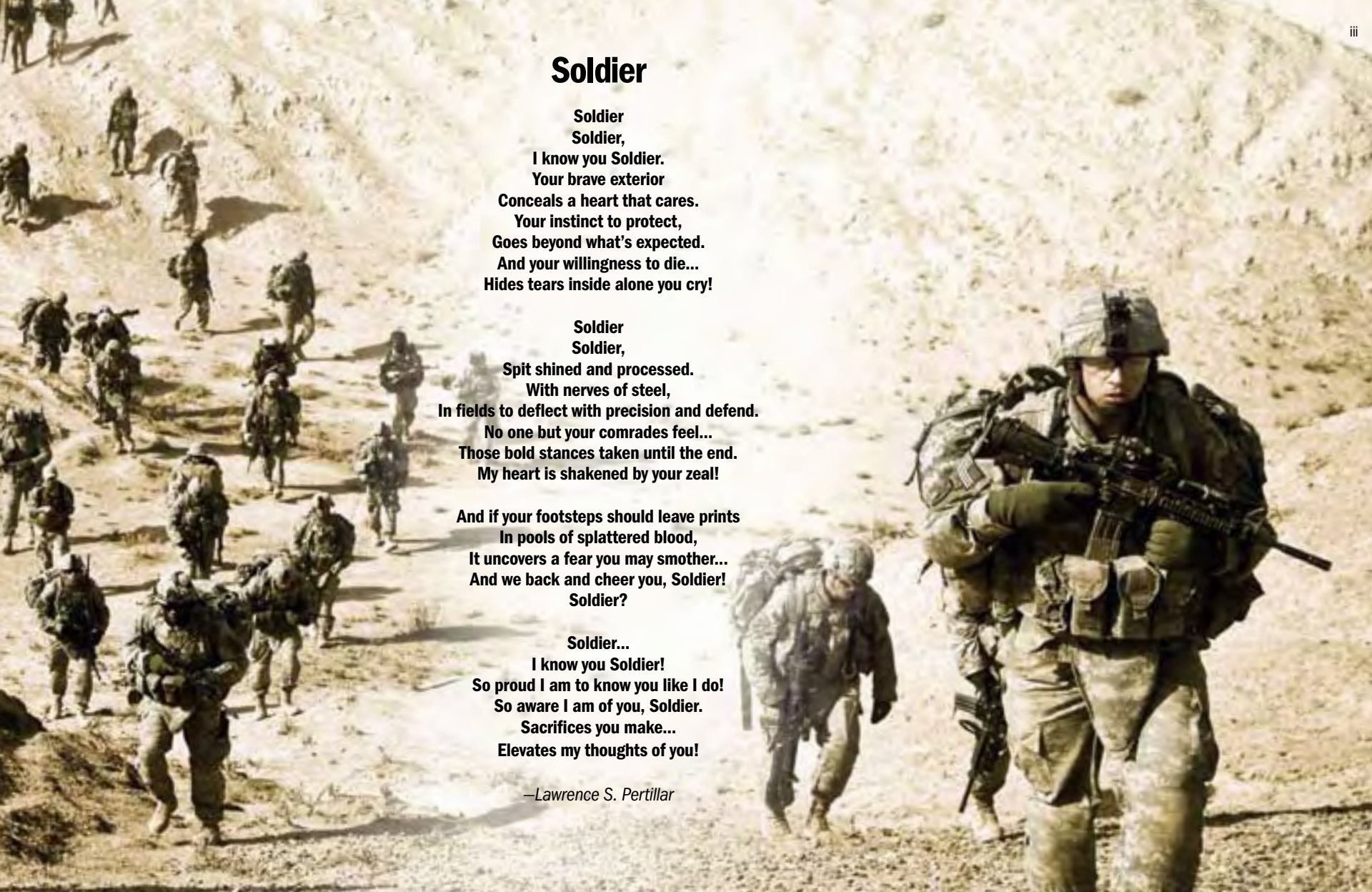
Soldier  
Soldier,  
I know you Soldier.  
Your brave exterior  
Conceals a heart that cares.  
Your instinct to protect,  
Goes beyond what's expected.  
And your willingness to die...  
Hides tears inside alone you cry!

Soldier  
Soldier,  
Spit shined and processed.  
With nerves of steel,  
In fields to deflect with precision and defend.  
No one but your comrades feel...  
Those bold stances taken until the end.  
My heart is shaken by your zeal!

And if your footsteps should leave prints  
In pools of splattered blood,  
It uncovers a fear you may smother...  
And we back and cheer you, Soldier!  
Soldier?

Soldier...  
I know you Soldier!  
So proud I am to know you like I do!  
So aware I am of you, Soldier.  
Sacrifices you make...  
Elevates my thoughts of you!

—Lawrence S. Pertillar





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"As Secretary of Defense, I am responsible for the war strategy and for signing the deployment orders to carry it out. Every day, my signature on a piece of paper sends our brave men and women in harm's way. At the end of the day, I must be able to look them in the eye—be they in Kandahar or Ramadi or Walter Reed—and tell them, truthfully, that this wealthy and generous country has done everything possible for them."

—Secretary of Defense Robert Gates

# Introduction

When a Soldier is deployed, anywhere in the world, on any mission, Program Executive Office (PEO) Soldier ensures that he or she is ready. PEO Soldier develops, acquires, and fields the best equipment to support every Soldier in the United States Army so that they have the highest level of protection, preparation, and power as they face increasingly hostile adversaries.

We at PEO Soldier have found that by treating the Soldiers as systems, we increase their effectiveness. With invaluable feedback from our Soldiers, we consider how each item of clothing or piece of equipment works with every other piece, an approach that has led to numerous improvements to Soldier equipment. Formerly, Soldiers were equipped with one piece of gear at a time, with little thought given to how the equipment worked together or, conversely, did not. The piecemeal approach to equipping Soldiers gave them a heavier combat load and created inefficiencies on the battlefield.

By using the Soldier-as-a-System concept, PEO Soldier has been able to eliminate redundancies in equipment and improve the protection, effectiveness, and comfort of our Soldiers.

The **Improved Outer Tactical Vest (IOTV)**, the foundation of **Interceptor Body Armor (IBA)**, highlights the success of the Soldier-as-a-System approach. The IOTV was based on the previously fielded Outer Tactical Vest (OTV). Earlier improvements to the OTV were made as add-ons. In engineering the IOTV, we explored ways to incorporate all of the add-ons, including the **Enhanced Side Ballistic Inserts**, into the main vest, thus reducing redundancy and bulk. We also considered how Soldiers carry their gear, and asked for their feedback as we made final improvements to the IOTV. We will continue to gather information from Soldiers as we consider additional changes to the IOTV and to other equipment.

IBA was designed initially to be worn over the Soldier's **Army Combat Uniform (ACU)**. However, Soldiers informed us that IBA worn in this manner created bulk and produced heat stress, potentially reducing Soldiers' effectiveness. To reduce heat stress, improve Soldier comfort and increase mission effectiveness, our engineers, working with our partners in industry, designed the long-sleeve **Army Combat Shirt (ACS)**. The flame-resistant (FR) shirt has sleeves similar to the FR ACU and a cool, moisture-wicking fabric over the torso areas covered by the IBA.

The Soldiers of the 4th Battalion, 9th Infantry Regiment of the 4th Stryker Brigade, 2nd Infantry Division (ID) were the first Soldiers equipped with the IOTV and among the first to wear the ACS. More important, they were the first Soldiers to take the Land Warrior system into combat. **Land Warrior** is a digital fighting system that gives Soldiers a distinct tactical advantage. It includes a Soldier-worn computer and a helmet-mounted display that flips down over one eye, allowing Soldiers to view mission plans and maps as well as friendly and enemy locations. The improved situational awareness

allows them to accomplish their missions more quickly with less risk. The Army has approved an Operational Needs Statement to equip the 5th Stryker Brigade, 2nd ID with the Land Warrior system.

Ongoing work on improving body armor, uniforms, and the next generation of ground, mounted and air Soldier systems demonstrates PEO Soldier's commitment to providing the best equipment possible to all of our Soldiers. They deserve nothing less.

One of the avenues for improving gear is the **Soldier Enhancement Program (SEP)**, which is jointly managed by PEO Soldier and Training and Doctrine Command (TRADOC) Capabilities Manager (TCM) Soldier. The SEP reviews commercial off-the-shelf items that can be ruggedized for combat and can improve Soldiers' effectiveness and performance. The SEP accepts suggestions from Soldiers, field commanders, industry leaders, and combat and materiel developers, and moves forward with items that can be developed and delivered within three years. One of the SEP's recent successes is the **M110 7.62mm Semi-Automatic Sniper System (SASS)**, an anti-personnel and light materiel weapon that fires out to a maximum effective range of 800 meters.

The SASS has a higher rate of fire, is more lethal than the M24 Sniper Weapon System, and is proving to be more effective in dangerous urban environments.

Each project manager or project director within PEO Soldier is equally dedicated to providing the best gear.



**PROJECT MANAGER SOLDIER WARRIOR**

PM Soldier Warrior (PM SWAR) supports Soldiers through Air Warrior, Mounted Soldier, and Ground Soldier. All of these programs provide significant improvements in situational awareness, lethality, survivability, and mobility. The Product Managers apply the Soldier-as-a-System concept to develop integrated systems designed to increase combat effectiveness, decrease combat load, and improve mission flexibility.

**Product Manager Air Warrior** integrates all aviation life support and mission equipment into an integrated aircrew ensemble that improves the combat effectiveness of the aircrew member. This system leverages several joint-service technology efforts to create a modular system that increases situational awareness, freedom of movement at the flight controls, enhances mobility to safely operate aircraft systems, reduces physiological stress, and facilitates ease of entry to and exit from the aircraft. The system also provides survival gear in the event of a downed aircraft over land or water.

**Product Manager Ground Soldier** connects the Soldier to the digital battlefield, improving situational awareness both for the individual Soldier and small-unit battle commands. Ground Soldier builds on Land Warrior’s capabilities to provide the dismounted Soldier with interoperability with the Future Combat System.

**Product Director Mounted Soldier** extends digital capabilities to vehicle crew members, including commanders, drivers, and gunners.

## PROJECT MANAGER SOLDIER EQUIPMENT

PM Soldier Equipment (PM SEQ) supports the Soldier with technologically advanced sensors, lasers, clothing, individual equipment, and protective gear. PM SEQ consists of three Product Managers: Product Manager Clothing and Individual Equipment, Product Manager Soldier Sensors and Lasers, and Product Manager Soldier Survivability.

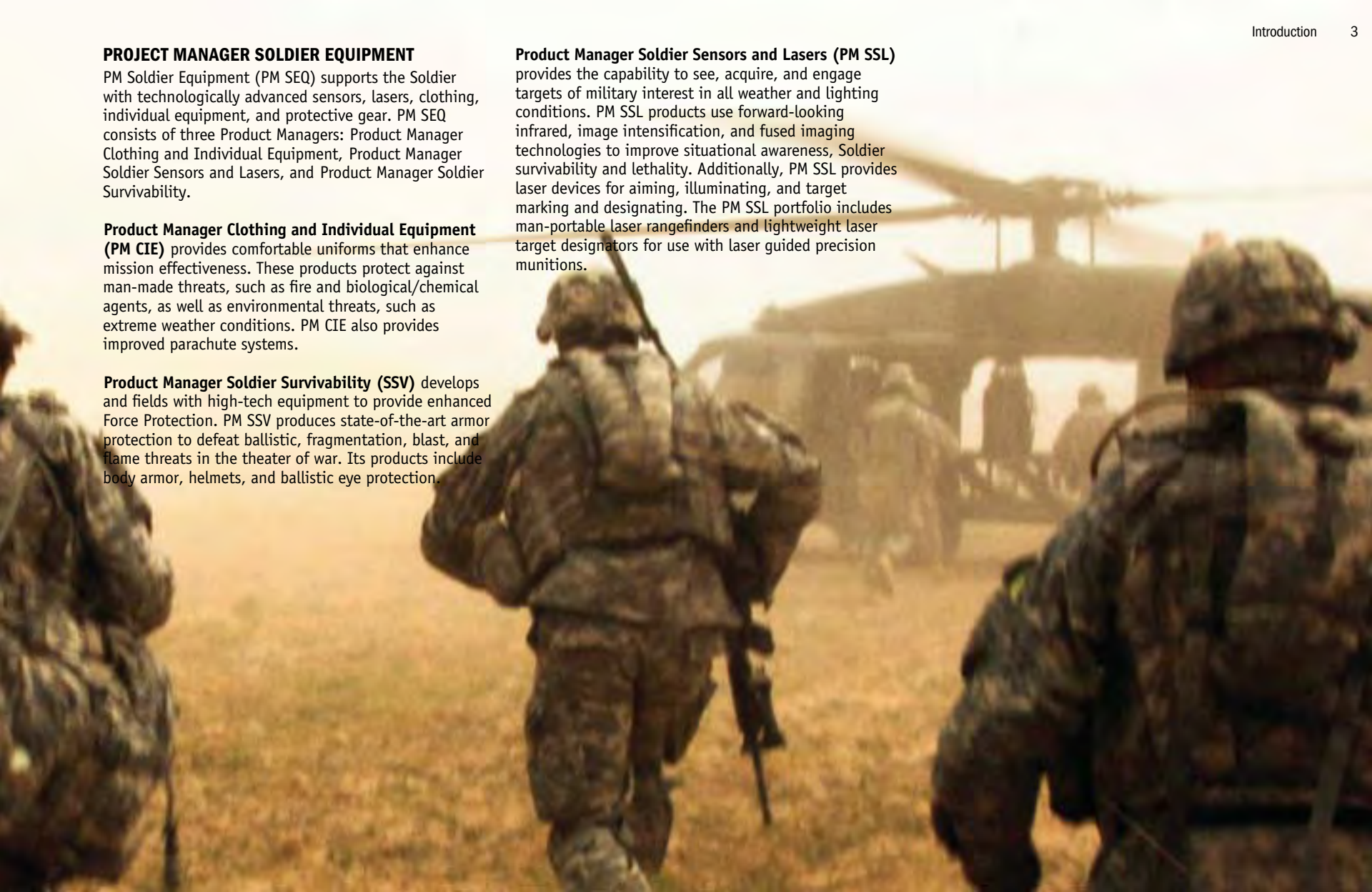
### Product Manager Clothing and Individual Equipment (PM CIE)

provides comfortable uniforms that enhance mission effectiveness. These products protect against man-made threats, such as fire and biological/chemical agents, as well as environmental threats, such as extreme weather conditions. PM CIE also provides improved parachute systems.

**Product Manager Soldier Survivability (SSV)** develops and fields with high-tech equipment to provide enhanced Force Protection. PM SSV produces state-of-the-art armor protection to defeat ballistic, fragmentation, blast, and flame threats in the theater of war. Its products include body armor, helmets, and ballistic eye protection.

### Product Manager Soldier Sensors and Lasers (PM SSL)

provides the capability to see, acquire, and engage targets of military interest in all weather and lighting conditions. PM SSL products use forward-looking infrared, image intensification, and fused imaging technologies to improve situational awareness, Soldier survivability and lethality. Additionally, PM SSL provides laser devices for aiming, illuminating, and target marking and designating. The PM SSL portfolio includes man-portable laser rangefinders and lightweight laser target designators for use with laser guided precision munitions.



### **PROJECT MANAGER SOLDIER WEAPONS**

PM Soldier Weapons (PM SW) provides the Soldier with the firepower to decisively defeat any enemy. Products include weapons, accessories, and ammunition that are reliable, durable, and proven in battle. PM SW also manages the development and procurement of suppressors, optics, tripods, mounts, and binoculars. PM SW includes Product Manager Individual Weapons and Product Manager Crew Served Weapons.

**Product Manager Individual Weapons** maintains and improves rifles, carbines, pistols, and grenade launchers for the Army and other services while also developing the next generation of individual weapons.

**Product Manager Crew Served Weapons** maintains and improves light, medium, and heavy machine guns, automatic grenade launchers, sniper systems, and associated fire control and target acquisition products for the Army and other services. It also manages the research and development of all small arms ammunition, such as the family of 25mm rounds.

## **PROJECT DIRECTOR, RAPID FIELDING INITIATIVE AND SOLDIER-AS-A-SYSTEM UNIT SET FIELDING**

The Rapid Fielding Initiative (RFI) supports deploying Soldiers and units through the planning, coordination, scheduling, and execution of pre-deployment fielding events. Soldier-as-a-System Unit Set Fielding (SaaS USF) builds upon the success and processes of RFI to ensure Soldiers and units are equipped in accordance with the Army Force Generation Operational Readiness Cycle. The SaaS USF methodology will ensure Soldiers have the opportunity to train with equipment developed by PEO Soldier before entering combat operations.

PEO Soldier plays an integral role in keeping America safe by supporting the enduring commitment and heroic efforts of our Soldiers, who make up the best military force in history. As the demands of war change and new technologies evolve, PEO Soldier stands ready to equip Soldiers with the best gear, in the shortest time, wherever our global interests dictate. The technologies that we develop and field are crucial components in meeting the challenges of today and those of the future.

We do all of this to support our Soldiers, who are the strength of our Army and the most advanced combat system in the Army's arsenal. PEO Soldier ensures that those Soldiers have everything they need to remain safe, vigilant, and effective.



# Soldier-as-a-System Effectiveness Evolution

Approx. 1941–1946  
**WWII**

The Soldiers in today's Army make up the best-prepared and best-equipped force in the history of warfare.

The American Soldiers who served in World War II went into battle well-trained and armed with the trusted M1 Garand rifle, but with little in the way of protection beyond a steel helmet. All Soldier equipment was carried in a bulky backpack, with smaller components stored in a combat belt. As American interests took Soldiers into Southeast Asia, improvements to training and Soldier equipment were incorporated. The standard issue weapon provided greater firepower, and a flak vest was included for personal protection. Uniforms had evolved to help the Soldier blend with the combat environment, and improvements were made for better weight distribution of combat equipment.

The challenges facing the American Soldier in the Global War on Terrorism prompted the establishment of Program Executive Office (PEO) Soldier in 2002. To address the needs of our fighting men and women, the Army initiated its Soldier-as-a-System strategy, whereby Soldier equipment is designed to work in an integrated manner that increases Soldier survivability, provides improved quality of life, and enhances mission effectiveness and lethality.

PEO Soldier ensures that our Soldiers have the best clothing and individual equipment, the best weapons, the best protection, and the best tools to enhance situational awareness—all of this at no cost to Soldiers. Soldiers, who are thoroughly trained in the use of their gear, can go into battle confident that they have the most up-to-date equipment—and with the knowledge that PEO Soldier remains vigilant in seeking the best possible equipment for the best fighting force in history.



**EQUIPMENT SPENDING PER SOLDIER\***

**\$1,981**

**MEASURES OF EFFECTIVENESS**

- 35.83 lbs
- Trained
- Armed

*\*Adjusted to 2006 dollars using the Consumer Price Index (CPI)  
<http://www.minneapolisfed.org/research/data/us/calc/>*

Approx. 1961–1973

Southeast Asia



\* Item not shown

\$1,941

- 35.06 lbs
- Trained
- Armed
- Lightly Protected

Approx. 2001–2009

GWOT



\$17,472

- 75.31 lbs
- Trained
- Armed
- Well Protected
- 24-Hour Precision Engagement

Future



\$28–60K Est.

- Trained
- Armed
- High Threat Protection Over All Critical Body
- Precision Engagement w/ Counter Defilade
- Part of Battle Command Network

**Project Manager Soldier Warrior (PM SWAR)** supports the Soldier-as-a-System concept through the acquisition of integrated warrior systems. Air Warrior, Ground Soldier, and Mounted Soldier programs provide significant capability improvements in:

- Tactical awareness
- Lethality
- Survivability
- Mobility
- Sustainment

**Air Warrior** integrates all aviation life support and mission equipment into a single aircrew ensemble that enhances cockpit synergy and aircraft mission capability.

**Ground Soldier** integrates the Soldier into the digital battlefield and improves individual Soldier and small unit battle command and tactical awareness.

**Mounted Soldier** combines cordless communications and personal displays with Soldier mission equipment and leverages capabilities developed in other warrior programs.

**Project Manager  
Soldier Warrior**

Product Manager  
Air Warrior

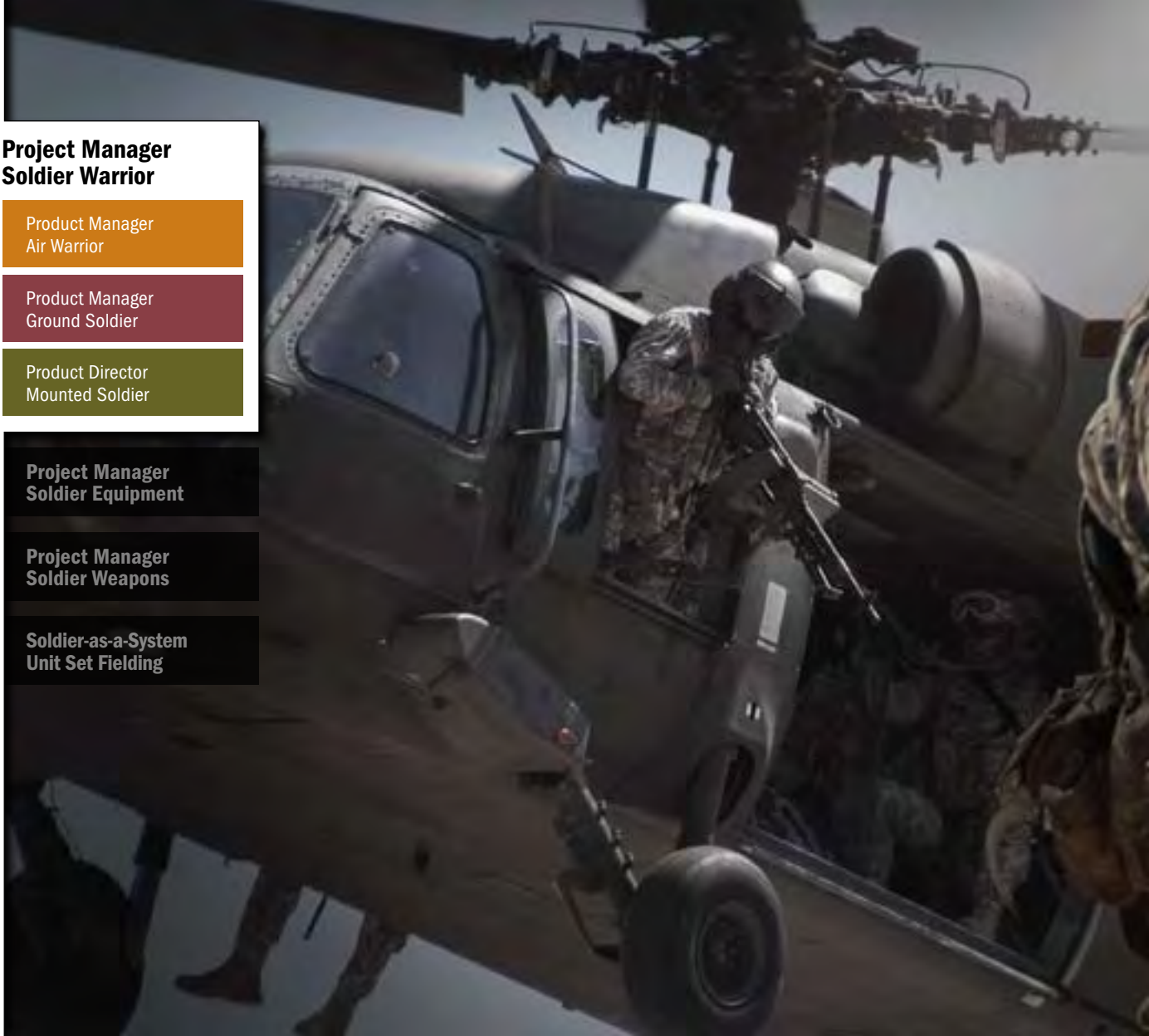
Product Manager  
Ground Soldier


Product Director  
Mounted Soldier

**Project Manager  
Soldier Equipment**

**Project Manager  
Soldier Weapons**

**Soldier-as-a-System  
Unit Set Fielding**



A soldier in full combat gear, including a helmet, goggles, and a tactical vest, is in the foreground, holding an M4-style rifle. In the background, other soldiers are visible, along with a military vehicle and a helicopter in the sky.

PROJECT MANAGER

# SOLDIER WARRIOR


“Every Soldier must know, before he goes into battle, how the little battle he is to fight fits into the larger picture and how the success of his fighting will influence the battle as a whole.”

—Field Marshal Sir Bernard Montgomery

**Product Manager Air Warrior (PM AW)**

integrates all aviation life support and mission equipment into an ensemble that improves the combat effectiveness of the Army aircrew member. This system leverages several joint-service technology efforts to create a modular system that increases situational awareness and freedom of movement at the flight controls, enhances mobility to safely operate aircraft systems, reduces physiological stress, and facilitates aircraft entry and exit. The system also provides survival gear in the event of a downed aircraft over land or water.

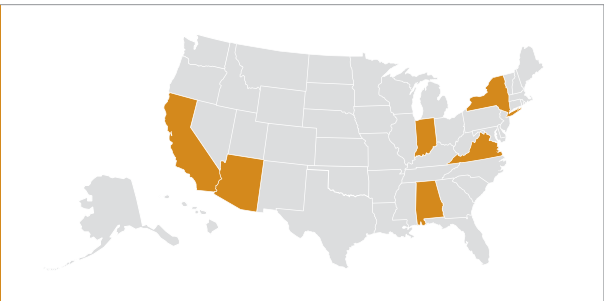




**“The Microclimate Cooling System made you very comfortable to fly. It kept you cool, and kept your mind on the mission, on flying, and not on how hot it is. It made you more comfortable to be a safer and more productive pilot.”**

—CW2 Gerald F. Castellano

*Provides enhanced mission effectiveness and the capability for a downed aircrew member to evade the enemy, survive, and return to safety.*



**Air Warrior (AW)** is a modular, integrated, rapidly reconfigurable combat aircrew ensemble that saves lives and maximizes Army aircrew mission performance. Previous aviation life support equipment consisted of a non-integrated assemblage of protective and survival gear. AW uses a systems approach to equipping the aircrew and closes the capability gap between human and machine. Fielded incrementally in blocks to rapidly provide enhanced capabilities to the warfighter, AW leverages and integrates clothing and equipment from other project managers such as the Army Aircrew Combat Uniform and ballistic protection.

**AW Block I provides:**

- Survival Equipment Subsystem, which integrates first aid, survival, signaling, and communications equipment with body armor and over-water survival subsystems
- Microclimate Cooling System, which increases effective mission duration in heat-stress environments by more than 350 percent
- Aircrew Integrated Helmet System, a lighter helmet with increased head and hearing protection

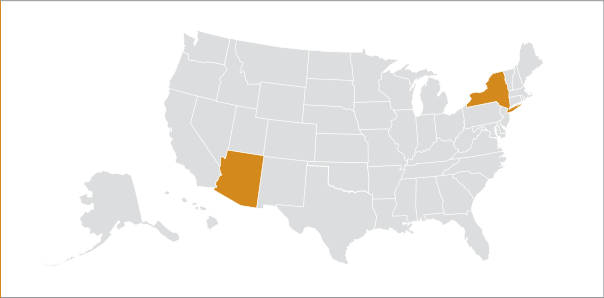
**AW Increment III:**

- Electronic Data Manager (EDM), a portable digital mission planning device that provides over-the-horizon messaging and enhanced situational awareness capabilities through connectivity to Blue Force Tracking—Aviation
- Aircraft Wireless Intercom System (AWIS), which provides secure cordless, hands-free aircrew intercommunications
- Go-Bag Assembly & Tie-Down Strap
- Hydration System
- Portable Helicopter Oxygen Delivery System



# Aircraft Wireless Intercom System (AWIS)

*Provides secure wireless communication between crew members in and around the aircraft during all missions.*



The **Aircraft Wireless Intercom System (AWIS)**, a joint development with the U.S. Navy, provides increased safety and mission performance such as medical evacuation of helicopter crew members and medical personnel during hoist rescue, and whenever flight medical crew members are conducting dismounted patient recovery missions in proximity to the aircraft. AWIS supplements the current aircraft corded intercom system for both flight and ground operations for the Army's CH-47 and HH/UH-60 aircraft, and the Navy's CH-46, SH-60, and CH/HH-53 aircraft. The system consists of one aircraft interface unit, up to six mobile equipment units, and one support station including battery charger. AWIS provides:

- Hands-free communication between hoist operators and rescue personnel on the hoist
- Full duplex voice-activated, hands-free mode, and a push-to-talk mode
- Fifty independent channels (aircraft networks) with up to six crew members on each aircraft network
- Simultaneous omnidirectional communications among all users within the aircraft network within 200 feet of the center of the aircraft



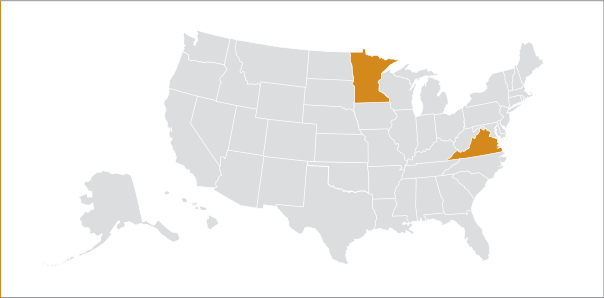
## Aircraft Wireless Intercom System (AWIS)

Air Warrior



# Aircraft Modular Survival System (AMSS)

*Provides supplemental survival equipment to allow a downed aircrew to survive for up to 72 hours without support.*



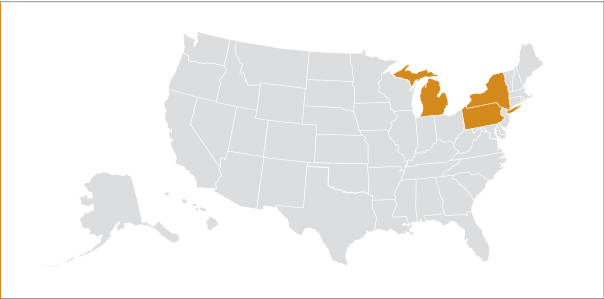
The **Aircraft Modular Survival System (AMSS)** is a portable, self-contained survival kit that enables an aircrew to survive in severe environments if immediate recovery is not possible. The system supplements the personal equipment worn or carried by the crew members. AMSS provides minimum survival equipment and sustenance for each aircrew member to survive for 72 hours, with degraded survival capability for 15 days. Components can be tailored to meet environmental conditions. U.S. Army Aviation and Missile Command Lifecycle Management Center manages the program.





# Aircrew Integrated Helmet System (AIHS), HGU-56/P

*Provides aircrew members with a lightweight helmet that increases mission effectiveness by offering improved comfort, impact protection, retention, and sound attenuation.*



The **Aircrew Integrated Helmet System (AIHS), HGU-56/P** is made of an advanced composite of graphite and Spectra (a high-performance polyethylene) and is available in six sizes to fit male and female crew members. The AIHS HGU-56/P is 15 to 20 percent lighter than the previous SPH-4 flight helmet it replaces.

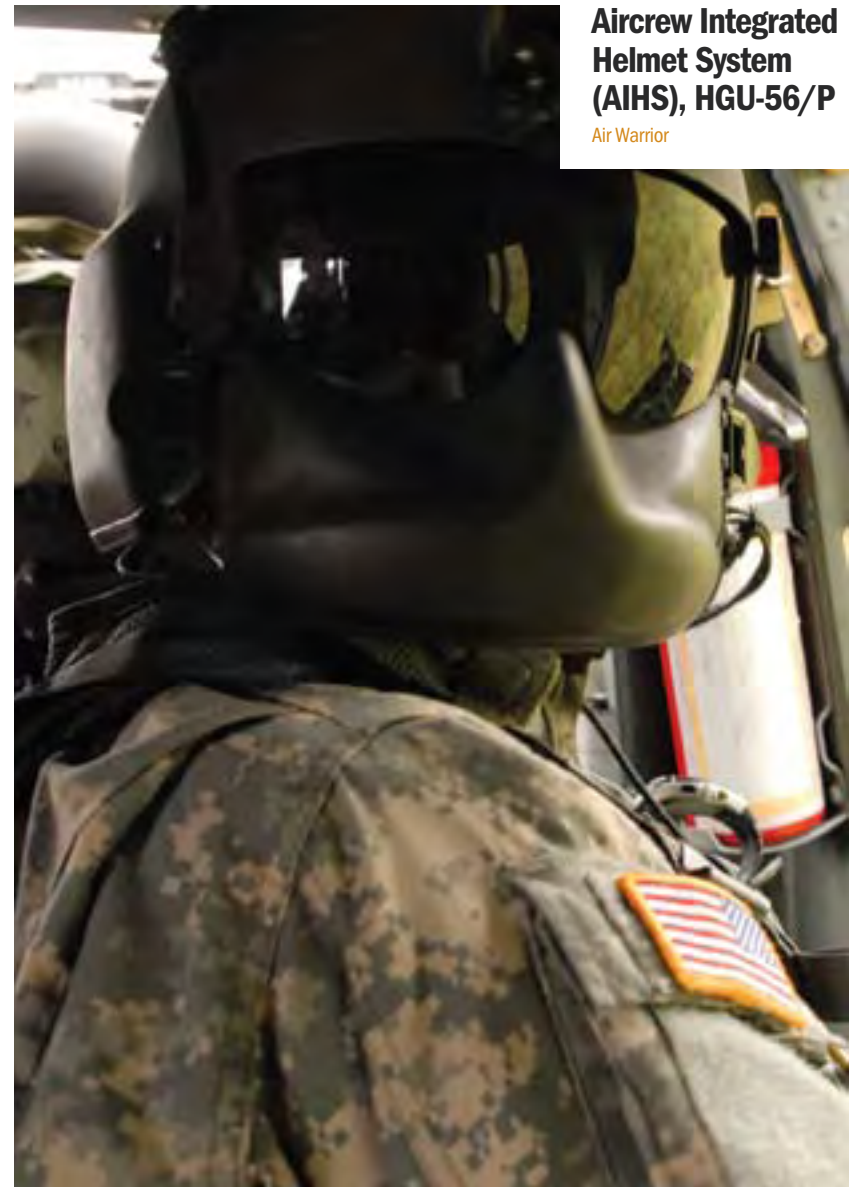
- Weight:** 3 pounds vs. 3.5 pounds
- Resulting impact:** 150 G vs. 400 G
- Chinstrap retention:** 440 pounds vs. 300 pounds
- Acoustic:** 82 decibels (A) vs. 85 decibels (A)

The AIHS HGU-56/P includes:

- Communication Ear Plugs fielded 2002: provide increased speech intelligibility and increased sound attenuation
- Maxillofacial Shield fielded 2003: provides fragmentation protection to the face

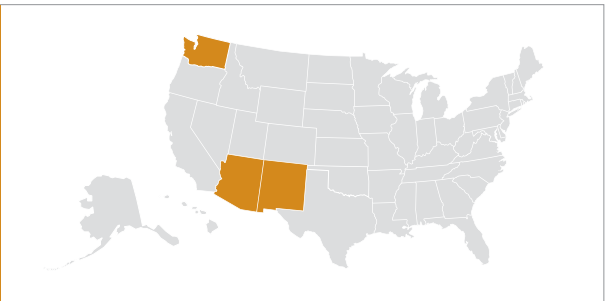
## Aircrew Integrated Helmet System (AIHS), HGU-56/P

Air Warrior



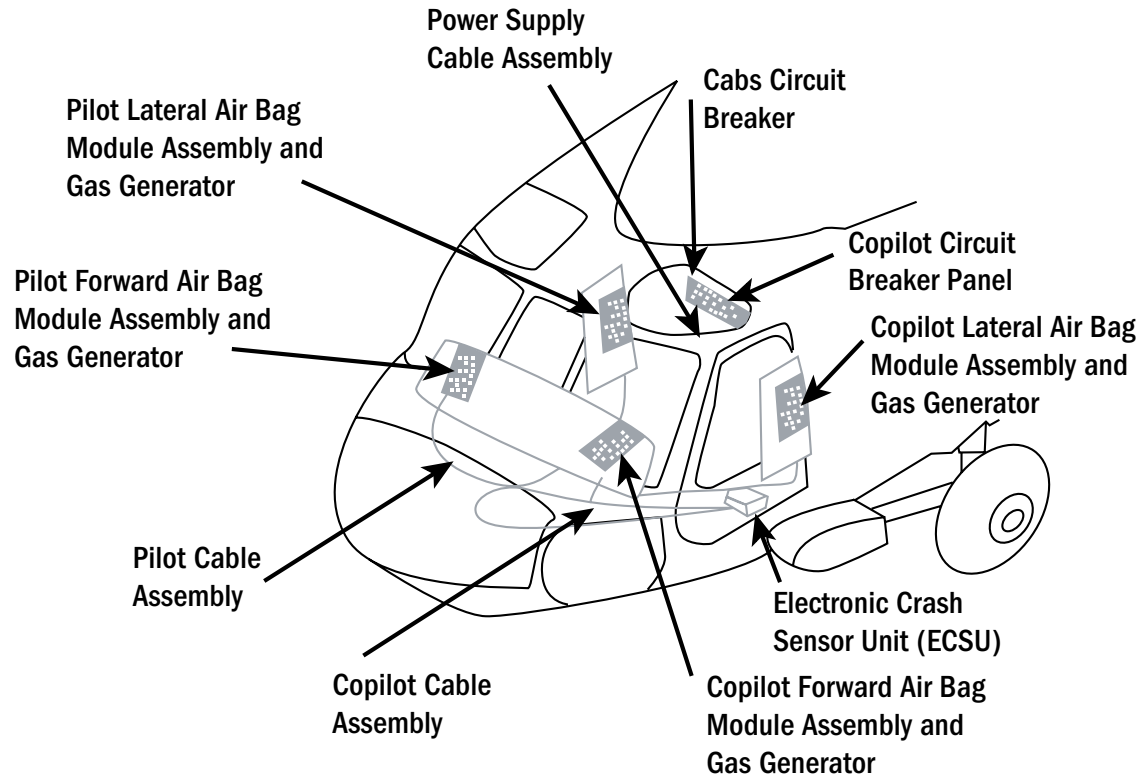
# Cockpit Air Bags System (CABS)

*Protects the aircrew from multiple cockpit strike hazards with a crash-activated, inflatable protection system that prevents or reduces injuries and lowers mortality risk.*



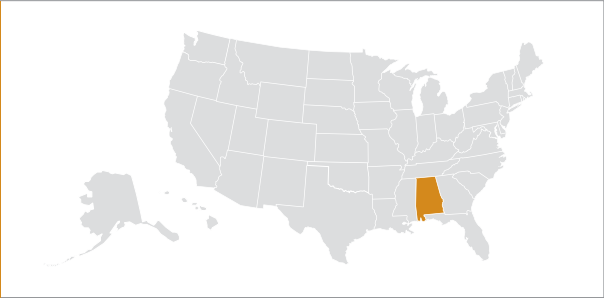
The **Cockpit Air Bags System (CABS)** protects the aviator from multiple strike hazards in the cockpit, including the flight controls, armor panels, instrument panels, glare shields, doors, and gun sights. CABS is designed to supplement the current restraint systems on helicopters. Although the system concept is similar to automotive air bags, CABS has been designed specifically for rotary wing applications.

When a crash occurs, the electronic crash sensor unit triggers inflation of the air bags, providing supplemental restraint that prevents or mitigates injuries and risk of death for the Army aviator. The crash sensor detects accelerations in three axes for a greater refinement of crash data input over its automotive counterparts. The gas generator/air bag assembly is designed to operate within the confines of a helicopter cockpit, ensuring extended occupant protection for secondary impacts, while allowing unobstructed egress from the aircraft after the system has deployed.



# Communication Ear Plugs (CEP)

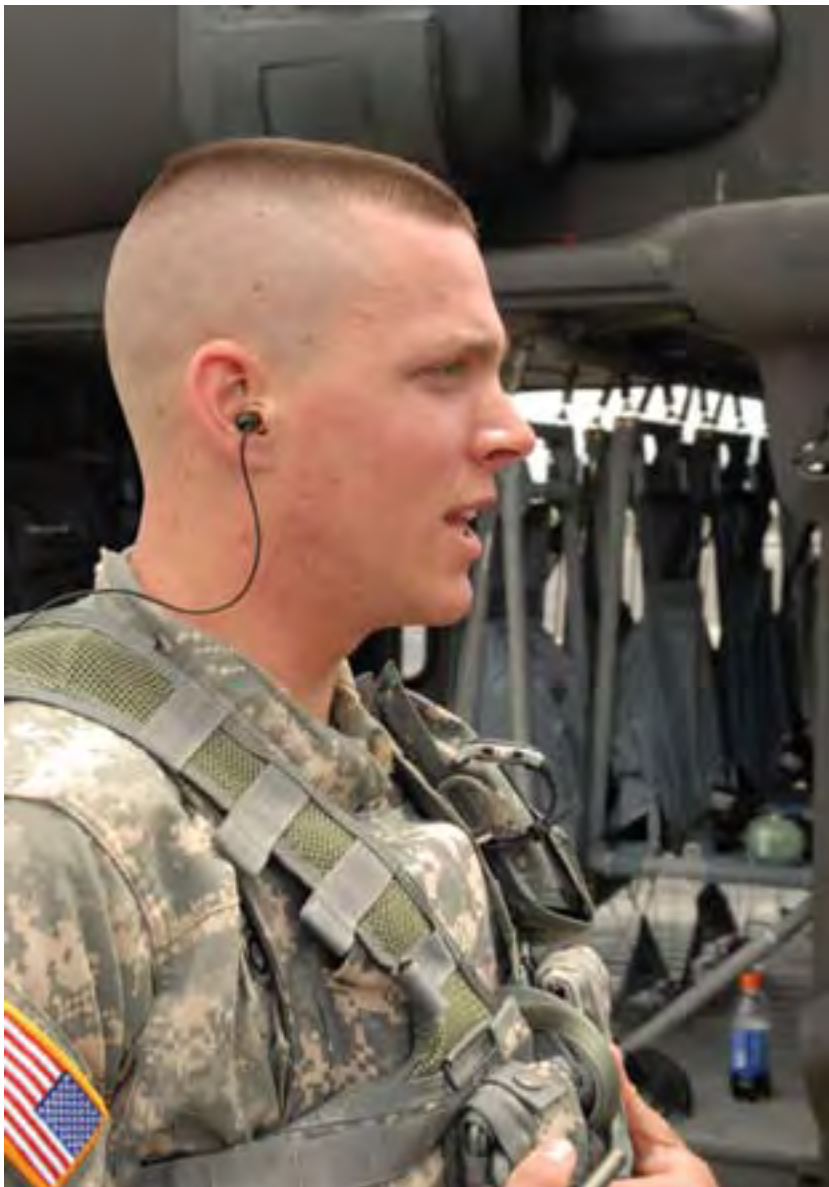
*Provides improved sound attenuation and speech intelligibility for Army aircrews.*



**Communication Ear Plugs (CEP)** are a pair of small sound transducers paired with hollow foam ear tips. The foam ear tips increase the sound attenuation already provided by the ear cups on the Aircrew Integrated Helmet System (AIHS), HGU-56/P, and the sound transducers provide a clear signal through the hollow foam ear tips. As a result, the Soldier hears clear communications that are not degraded by ambient noise. CEP were initially added to fielded HGU-56/P helmets through a modification work order (MWO) and are now integrated into new helmets during production.

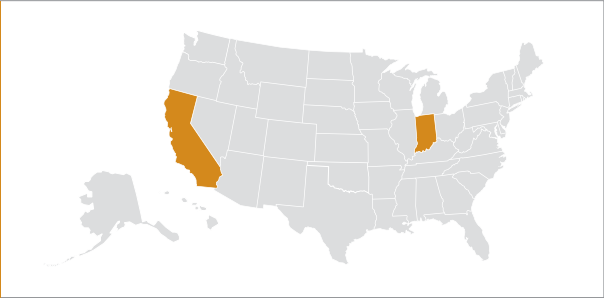


Air Warrior



# Electronic Data Manager (EDM)

*Enables aircrew members to plan missions quickly and react to mission changes while in flight.*



The **Electronic Data Manager (EDM)** is a light, portable touch-screen computer in the form of a kneeboard that provides the aviator with global positioning system (GPS) moving map capabilities, sunlight readability, and the ability to use Windows-based software.

The EDM includes the following:

- Moving map display (GPS aircraft position and waypoints)
- Tactical graphics
- Two-way Blue Force Tracking—Aviation situational awareness
- Beyond Line of Sight text messaging
- Displays of checklists, manuals, and approach plates in PDF format
- Capability to import mission planning data from Aviation Mission Planning Systems software
- Weight and balance calculations
- Aircraft performance planning calculations
- Electronic notes

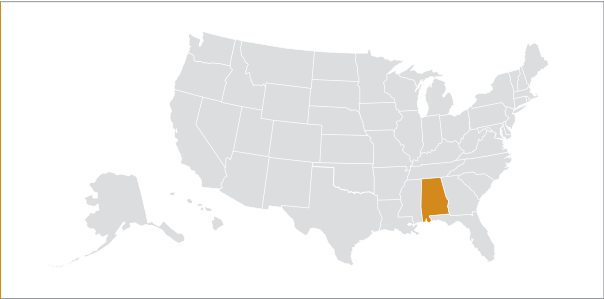
## Electronic Data Manager (EDM)

Air Warrior



# Go-Bag Assembly and Tie-Down Strap

*Provides carriage space for a 72-hour suite of life support equipment and water in a flame retardant pack.*



The **Go-Bag Assembly and Tie-Down Strap** improve mission endurance by providing water to the aircrew member and supplemental survival gear in the event of an escape and evade scenario. The Go-Bag is mounted on the aircraft close enough to allow gear that would otherwise be worn by the crewmember to be off-loaded to the Go-Bag. This gear remains within reach during an emergency egress, resulting in increased freedom of movement and comfort for the Aviator during flight. The Go-Bag Assembly provides carriage for additional mission-specific gear and ammunition magazines. The Go-Bag Assemblies and Tie-Down Straps are unit issue, with the Tie-Down being configured specifically per platform.

The Go-Bag Assembly and Tie-Down are:

- Configurable as an escape and evasion or “Grab and Go” bag
- Capable of being worn like an assault pack
- Capable of additional equipment carriage
  - Requirements include:
    - Additional ammunition
    - Insertable “on the go” hydration system
    - Sleep system bag and carrier
    - Additional environmental gear and 72 hours’ worth of nutritional intake
- Secure up to a 40G crash load

# Go-Bag Assembly and Tie-Down Strap

Air Warrior

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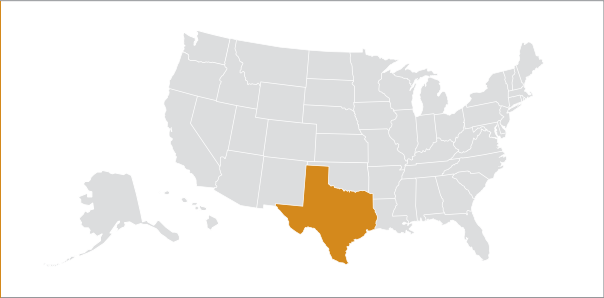


Tie-Down Straps



# Heads-Up Display (HUD) System, AN/AVS-7(V)

*Provides pilots with flight symbology while using the Aviator's Night Vision Imaging System (ANVIS) during night flight operations.*



The **AN/AVS-7(V) Heads-Up Display (HUD)** provides critical operational information superimposed on the image the pilot sees through his or her Aviator Night Vision Imaging System. The HUD minimizes the requirement for the pilots to continually look into the cockpit for instrument data, thereby allowing the pilots increased situational awareness outside the aircraft. The HUD system consists of the A-Kit, which is the wiring harnesses, mounting brackets, and some additional sensors such as Air Data Transducers, inclinometers, and Thermocouple Amps; and a B-Kit, which consists of one CV-4229(V)/AVS-7, one Signal Data Converter; one C-12293/AVS-7, one Converter Control Unit; and two SU-180/AVS-7 Display Units.



CV-4229(V)  
7Signal Data Converter, EPW



C-12293/AVS-7  
Converter Control Unit



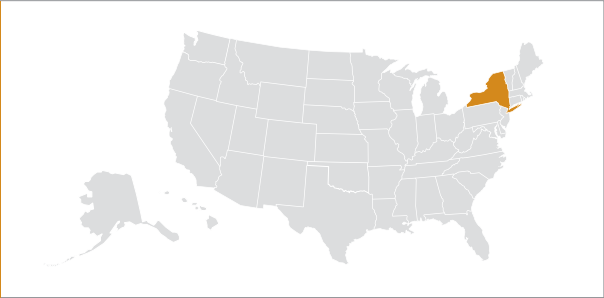
SU-180/AVS-Current CRT Display Unit

CV-4229(V)  
7Signal Data Converter, BAE



# Helicopter Oxygen System (HOS)

*Provides approximately one and a half hours of supplemental oxygen for six crewmembers at high altitude for search-and-rescue operations employing utility and cargo helicopters.*



The **Helicopter Oxygen System (HOS)** is a portable, multi-user oxygen system for high-altitude operations up to 25,000 feet above mean sea level, such as search-and-rescue missions for selected units with utility and cargo helicopters. The HOS is integrated with the standard MBU-12/P Oxygen Mask mounted to aviation helmets. The system is used by all services and weighs approximately 125 pounds. The HOS requires no aircraft modification.

## Helicopter Oxygen System (HOS)

Air Warrior



Helicopter Oxygen System (HOS)

*Provides a flame-retardant carrier for 100 ounces of mission and survival water for aircrew members.*



The **Hydration System** improves mission endurance by providing water to the aircrew members, and by providing for collection of local water. A combination of items, including an in-line filter for “on-the-go” purification and a supply of chlorine tablets for water sterilization, ensure that local water is potable. The system is body-mounted and integrates with the Air Warrior Primary Survival Gear Carrier. The water reservoir can be mounted in the Go-Bag Assembly, placing the mission water in proximity to the aircrew member to provide mission drinking water, but also keeping it within reach during an emergency egress. The Hydration System provides a Pouch Attachment Ladder System interface for carrying additional ammunition magazines. The Hydration System is personal issue.

It has the following capabilities:

- 100-ounce capacity
- Nuclear, Biological, Chemical mask compatible
- Single-hand operable
- Usable in flight



# Laser Eye Protection Visor, Joint Advanced

*Protects aircrew members' eyes from multiple low-energy laser hazards and threats.*



The **Joint Advanced Laser Eye Protection Visor (JALEPV)** is a polycarbonate ballistic visor that uses holographic, dielectric reflective, and dye technologies to protect aircrews from multiple-threat wavelengths. This visor is being fabricated for the Army in the HGU-56/P configuration. It will be suitable for day or unaided night flight. The JALEPV program is a joint Army-Navy development program led by the Navy.



## Laser Eye Protection Visor, Joint Advanced

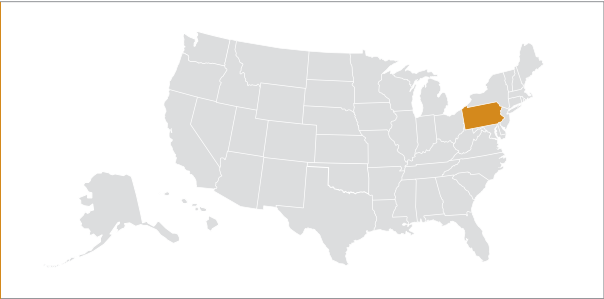
Air Warrior



# Laser Eye Protection Visor, Two- and Three-Wavelength

*Protects aircrew members' eyes from low-energy laser threats.*

Polycarbonate visors, like the **Laser Eye Protection Visor, Two- and Three-Wavelength**, provide aircrews protection from the primary laser threats and hazards on today's modern battlefield.



## Laser Eye Protection Visor, Two- and Three- Wavelength

Air Warrior



*Provides aircrew with ballistic protection from fragments and structure impacts.*



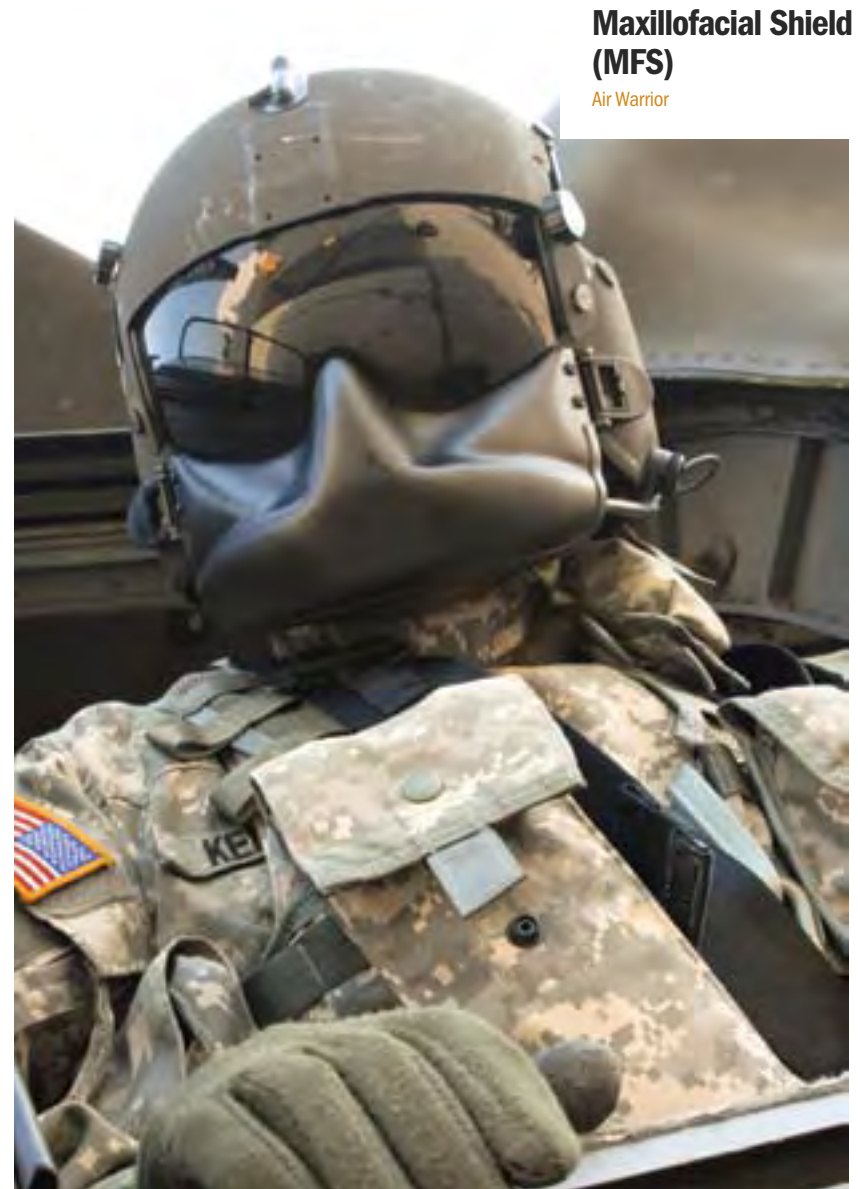
The **Maxillofacial Shield (MFS)** protects Army aircrew members from ballistic threats, and also provides improved field of view and anti-fogging capabilities over the previous MFS design. It is to be used with the HGU-SL/P helmet. It is compatible with visors, Aviator Night Vision Imaging System, Communication Ear Plugs, spectacles, microphones, and lip lights.



# Maxillofacial Shield (MFS)

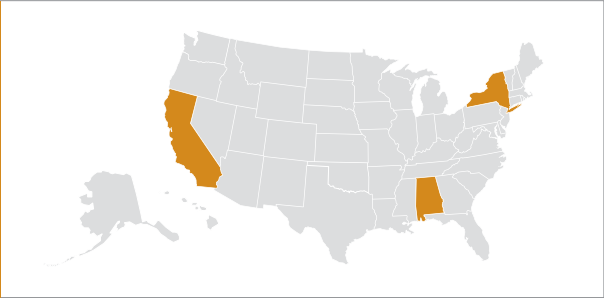
Air Warrior

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# Microclimate Cooling System (MCS)

*Protects the individual aircrew member from heat stress injuries with personal climate control for chemical or biological warfare in hot weather environments.*



The **Microclimate Cooling System (MCS)** reduces heat stress to Army helicopter crew members, especially while they are wearing chemical protective equipment in hot weather. The MCS gives Army aviators an increase of more than 350 percent (from 1.6 hours to 5.7 hours) in heat-stress mission endurance times while they are wearing chemical protective equipment or other crew member clothing. The MCS includes a quick-disconnect function to allow aircrew members to safely and quickly exit an aircraft without a snagging hazard.

The MCS includes a **Microclimate Cooling Garment (MCG)**, a vest worn as an undergarment, and a small **Microclimate Cooling Unit (MCU)**, an autonomous vapor compressor system that chills water and pumps it through small tubes embedded in the vest. The vest is worn beneath chemical protective clothing or other crew member clothing. The system enables crew members to function in chemical, biological, or hot weather environments without suffering heat stress.



# Microclimate Cooling System (MCS)

Air Warrior



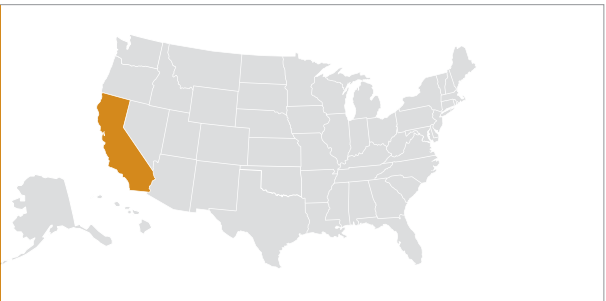
Microclimate Cooling Garment MCG



Microclimate Cooling Unit

# Portable Helicopter Oxygen Delivery System (PHODS)

*Provides the Soldier with compressed oxygen to altitudes above 10,000 feet.*



The **Portable Helicopter Oxygen Delivery System (PHODS)** is a Soldier-worn portable oxygen system that delivers compressed oxygen from a lightweight steel oxygen bottle (located on the ALSE or Air Warrior vest) via a nasal cannula, up to 18,000 feet, and via a mask at altitudes above 18,000 feet. PHODS uses a battery-powered pulse demand oxygen regulator unit that automatically provides “on-demand” oxygen regulated to altitude based on detected barometric pressure. The PHODS regulator includes algorithms to detect and react to the aviator’s breathing patterns to ensure that the user is receiving the proper oxygen flow based on individual physiological constraints.

PHODS uses a small 2 cubic liter non-shatter steel cylinder to provide approximately 2 hours of high altitude operations. PHODS will be supported by a mobile oxygen generating/recharge station that will be provided to designated units. The station combines the high pressure and variable flow rate available from an oxygen cylinder with the oxygen generation and replenishment of an oxygen concentrator. By simply connecting an empty oxygen cylinder(s) it will automatically refill. These mobile stations have the added benefit of being easily transported to battlefield locations.



Basic PHODS with case & optional mask

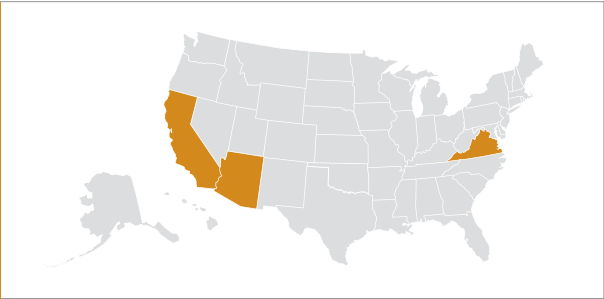
O2 Fill Station



44

# Survival Equipment Subsystem (SES)

*Supplements the aircrew ensemble with advanced life support, ballistic protection, and chemical-biological protection in rapidly tailorable, mission-configured modules.*



The **Survival Equipment Subsystem (SES)** consists of components integrated to maximize safe aircraft operation and human performance without encumbering the aircrew. These components include a Primary Survival Gear Carrier that includes first aid, survival, signaling, and communications equipment; an aircrew survival egress knife; a universal holster with ambidextrous Modular Lightweight Load-Carrying Equipment; thigh and shoulder configurations; and flexible body armor with a ballistic upgrade plate. For over-water missions, the ensemble includes a flotation collar and an over-water gear carrier with a single-place life raft and underwater breathing device.



# Survival Equipment Subsystem (SES)

Air Warrior

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**Product Manager Ground Soldier  
(PM GS)**

provides the dismounted Soldier with unprecedented situational awareness and battle command. Digital imagery and GPS locations provided by Land Warrior enable thorough mission planning, ramp-side convoy briefings, and on-the-fly changes during missions for high-value targets (HVTs). Land Warrior allows teams, squads, and platoons to pinpoint the exact building or location of improvised explosive devices (IEDs), cells or HVTs with better speed and precision, resulting in kill or capture of the enemy. Land Warrior enhances dismounted Soldiers' survivability by rapidly sending locations of suspected enemy IEDs and snipers. Land Warrior also helps prevent fratricide by providing locations of mounted and dismounted Soldiers.



**“Land Warrior is one piece of equipment that we won’t leave the FOB without anymore. We don’t miss a turn, we don’t miss a target, we don’t miss a house.”**

**—MSG Marc Griffith, 4th Battalion, 9th Infantry Regiment**



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# Commander's Digital Assistant (CDA)

*Provides the Soldier with enhanced situational awareness that supports communications, provides Blue Force Tracking, and gives leaders a capability for mission planning and support.*



The **Commander's Digital Assistant (CDA)** provides Blue Force Tracking Battle Command capabilities to commanders in the field. The CDA (Version 5) consists of the following integrated and ruggedized components:

- Computer with satellite communications
- Military Global Positioning System (GPS) (GB-GRAM)
- Interface to terrestrial radios
- 20GB hard disk
- 6.5-inch sunlight readable LCD screen
- Force XXI Battle Command, Brigade-and-Below (FBCB2) battle command software

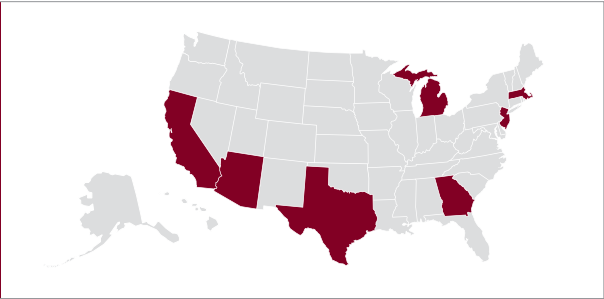


## Commander's Digital Assistant (CDA)

Ground Soldier



*Provides unprecedented Soldier tactical awareness and significant improvements in lethality, survivability, mobility, and sustainability.*



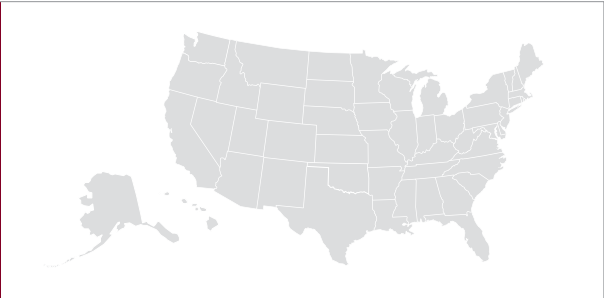
**Land Warrior** is a first-generation integrated modular fighting system for dismounted Soldiers that combines state-of-the-art technologies to create a lethal, survivable Soldier System linked to the digital battlefield. Land Warrior integrates computers, lasers, and radios to substantially improve situational awareness, mobility, sustainability, survivability, and lethality. The systems approach optimizes and integrates multiple capabilities with minimal impact on the Soldier’s combat load and logistical footprint. Land Warrior is interoperable with the Army Battle Command System. The system was successfully used for the first time in theater by the 4th Battalion, 9th Infantry Regiment (4-9 IN), 4th (Stryker) Brigade, 2nd Infantry Division. The unit was in Iraq from April 2007 through June 2008.



## Land Warrior

Ground Soldier

*Provides overmatch operational capabilities to all ground combat Soldiers, their attachments, and small units.*



**The Ground Soldier System (GSS)** is an integrated dismounted Soldier situational awareness (SA) system for use during combat operations. The system provides unparalleled situational awareness to the dismounted Soldier, allowing for faster and more accurate decisions in the tactical fight. By being at the right place, at the right time, with the right equipment, Soldiers are more effective and more lethal in the execution of their combat mission. The initial increments of the GSS program will focus on the development of the SA system or the Ground Soldier Ensemble (GSE).


The centerpiece capability of GSE is the ability to graphically display the individual Soldier location on a digital geo-referenced image. Additional Soldier locations will also be graphically displayed on the digital medium through the Army Battle Command System connected through a radio that will send and receive information from one to another thus connecting the dismounted Soldier to the network. These radios will also connect the combat Soldier to higher echelon data and information products to assist the Soldier in decision making and situational understanding. All of this will be integrated on a graphic user interface that is user defined, allowing the Soldier to easily see, understand, and interact in the method that best suits the user and his particular mission.

Ground Soldier will employ a system-of-systems approach, optimizing and integrating capabilities, while reducing the Soldier's combat load and logistical footprint. Soldier system spiral development that began with Land Warrior will continue with Ground Soldier.



**Product Director Mounted Soldier (PD MS)** extends digital capabilities to vehicle crew members, including commanders, drivers, and gunners.

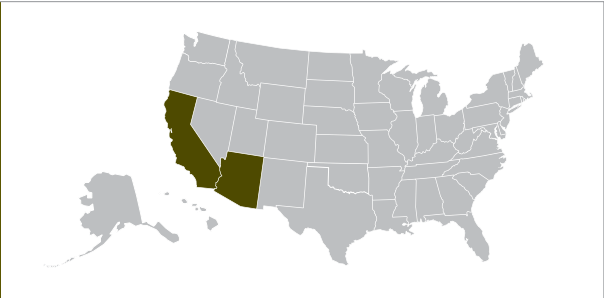




**With Mounted Warrior, “you have the ability to move with the people so you don’t leave them stranded. You can move with them even though you’re not in visual contact with them.”**

—Sgt. Brian Gardner, C Company,  
4th Battalion, 9th Infantry Regiment

*Improves the survivability, situational awareness, lethality, mobility, and sustainability of combat vehicle crewmen.*



**Mounted Soldier** is an evolutionary program, with identified increments. Increment I, which provided the Mounted Warrior capabilities, and Increment II, which augments the capabilities under the Mounted Soldier System (MSS), include:

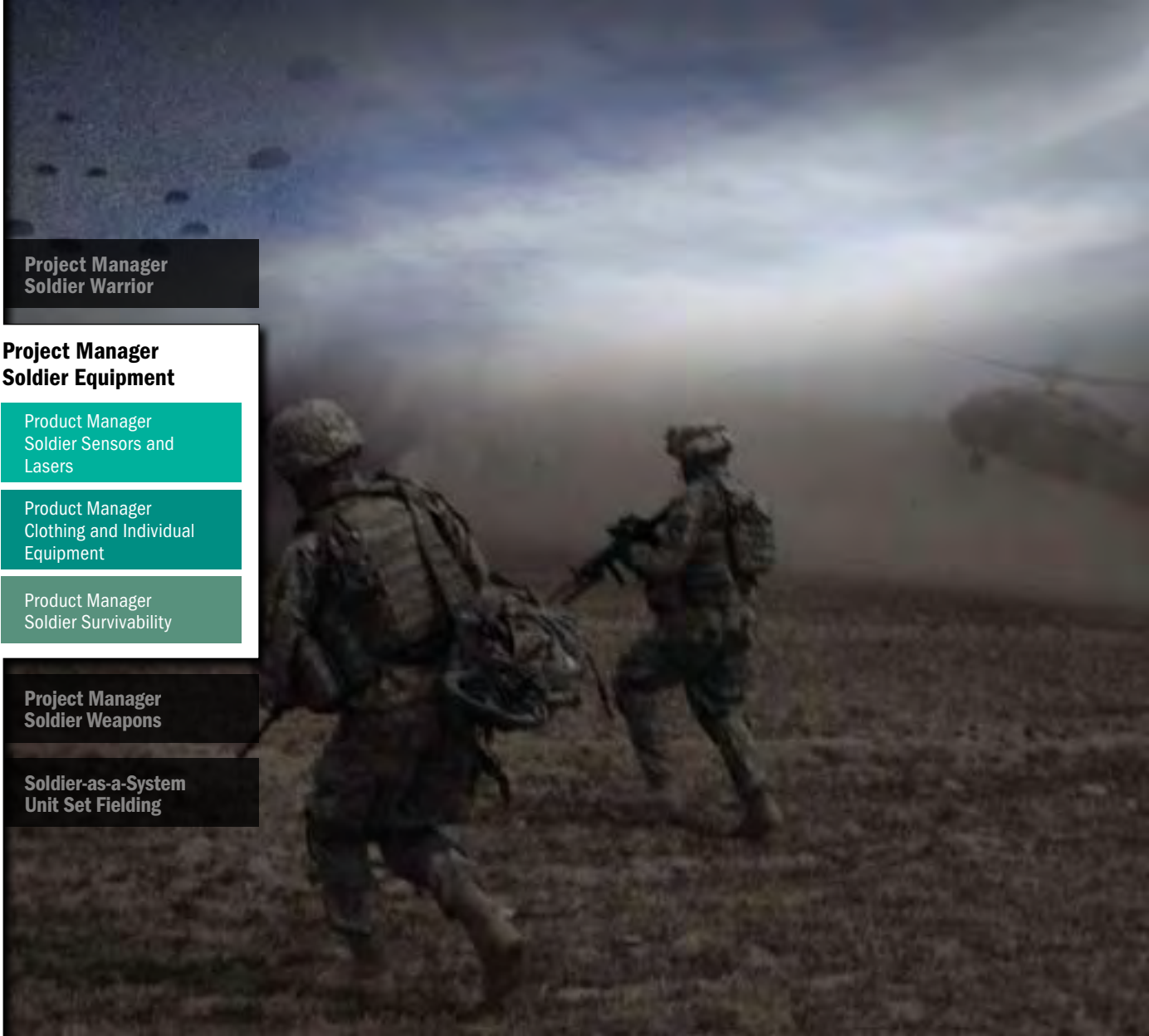
- Integrated headgear with helmet-mounted display to provide remote viewing of platform-based displays and optical sensors such as thermal sights
- Cooling vest to reduce heat stress
- Cordless communications to interface with the vehicle subsystem.

MSS will provide the combat vehicle commander increased capabilities to conduct offensive and defensive operations. Currently, the MSS comprises three subsystems: Display Subsystem, Cordless Communication Subsystem, Cooling Subsystem. The subsystems will provide platform commanders and vehicle crew members with increased effectiveness on the network-centric battlefield in areas of command and control, situational awareness, communications, and force protection.



**Project Manager Soldier Equipment (PM SEQ)** develops, fields, and sustains the world’s best Soldier equipment to advance Soldiers’ warfighting capabilities. PM Soldier Equipment procures, adapts, or develops state-of-the-art sensors, lasers, clothing, other individual equipment, and survivability items, including:

- Helmet-mounted vision enhancements for improved situational awareness in all visibility conditions
- Weapon sights for enhanced target acquisition
- Weapon-mounted and Soldier-carried sensors and lasers for accurate location of targets by pointing, illuminating, locating, and/or designating
- Ballistic and fragmentation protection
- Technologically advanced tactical equipment for the individual Soldier
- Environmental protective clothing
- Individual chemical protective gear
- Personnel airdrop equipment
- Flame-resistant clothing
- Clothing Bag items




**Project Manager  
Soldier Warrior**

- Project Manager  
Soldier Equipment**
- Product Manager  
Soldier Sensors and  
Lasers
- Product Manager  
Clothing and Individual  
Equipment
- Product Manager  
Soldier Survivability

**Project Manager  
Soldier Weapons**

**Soldier-as-a-System  
Unit Set Fielding**



PROJECT MANAGER

# SOLDIER EQUIPMENT

“We must do everything we could to convince the Soldier that we were all solicitude for his well being. I was for supplying everything we could and [only] then requiring him to fight to the death when the time came... you couldn’t be severe in your demands unless [the Soldier] was convinced that you were doing everything you could to make matters well for him.”

—Gen. George Marshall

### Certification Logo on Approved Gear

A PEO Soldier Certification Logo is designed to help Soldiers and their commanders identify clothing and equipment that meet the Army's high standards for safety, performance and durability.

The logo will be used to identify approved flame-resistant (FR) gloves, flashlights, and combat eyewear. Additional items will be added. Depending on the product, the logo will either be incorporated into a tag or branded directly onto the equipment.

Soldiers who choose to purchase their own FR gloves or flashlights should be aware that not all products labeled by manufacturers as Army-approved have actually been certified for military use. Only equipment with this official logo meets Army standards, and manufacturers must submit their products for testing by the Army before receiving permission to use the logo. PEO Soldier has numerous checks in place to ensure that products are reviewed periodically so that a high standard is maintained and that compliance with requirements is not compromised. Fraudulent use of the logo could result in punitive actions including debarment from future contracts.

The logo is the latest PEO Soldier initiative to ensure that Soldiers are not misled into purchasing knock-off items that may not provide adequate protection or performance. The logo will be readily visible so that leaders can quickly confirm that their Soldiers are wearing appropriate gear before they enter the combat environment.

### Flame-Resistant (FR) Gloves

Wearing authorized FR gloves has been proven to reduce burns. The logo is an extension of an initiative to develop the approved product list (APL) for combat gloves. FR combat gloves are provided to all Soldiers before they deploy, but PEO Soldier has acknowledged that there is a wide range of personal preferences when it comes to fit and style and that Soldiers often want to buy their own gloves. The APL provides information on products that meet individual needs regarding mission and price.

The APL for gloves is available at [www.peosoldier.army.mil/docs/FRCombatGlove.pdf](http://www.peosoldier.army.mil/docs/FRCombatGlove.pdf). The Army and Air Force Exchange Service/Military Clothing Sales Stores also provide the lists.

### Family of Flashlights (FoF)

The focus of the FoF is to provide an increased illumination capability that is highly effective and more reliable than previous illuminators. The FoF will fill a current capability gap by providing lighter, more versatile and more durable multifunctional lights that feature increased range and better power management.

The FoF began as a Soldier Enhancement Program (SEP) initiative in 2003. The FoF will improve the Soldier's ability to illuminate the battlefield and perform a myriad of duties, including reading maps, performing first aid and maintenance duties, navigating terrain, signaling, conducting searches, and identifying targets. The variants of the FoF will considerably enhance the Soldiers' tactical advantage, survivability, and mobility.

### Authorized Protective Eyewear List (APEL)

The APEL was created in response to a high incidence of eye injuries in deployed Soldiers who were choosing to wear eyewear that was not Army-approved for ballistic protection. The APEL provides Soldiers with a range of choices in protective eyewear that have been evaluated and meet military standards for protection from ballistic fragmentation. The APEL offers products in a variety of modern styles and sizes.

The commercially available alternatives on the APEL have recently been tested for laser protection equal to current Army standards for eyewear. After completing a user evaluation in 2009, new stock numbers for these laser protective APEL products will be assigned.

Packaging for approved eyewear carries the widely recognized green APEL sticker; the new APL logo will be applied to the packaging and eyewear itself at a later date.





# Approved Product List



**Testing:** All items are qualified to rigorous Eyewear standards. Items are tested by users in the field and must meet technical performance specifications

**Choice:** Provides options to units and soldiers in a variety of sizes and styles

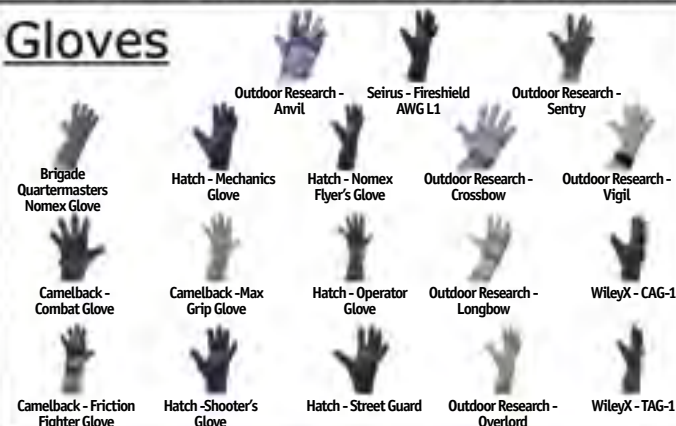
**Flexibility:** Products are added/subtracted from the APL as needs change

**Partner:** Multiple stakeholders, user, medical, etc. Participate in developing the APL to best meet current and emerging user needs

## Eyewear



## Gloves




## Flashlights



**Product Manager Soldier Sensors and Lasers (PM SSL)** develops, produces, and fields advanced sensor and laser devices that provide Soldiers with improved lethality, mobility, and survivability. Soldier-borne sensors and lasers enhance the Soldier's ability to see in all battlefield and lighting conditions, to acquire objects of military significance before the Soldier is detected, and to target threat objects accurately for engagement by Soldiers or guided munitions. In short, PM SSL provides Soldiers the ability to see always, acquire first, and target once.



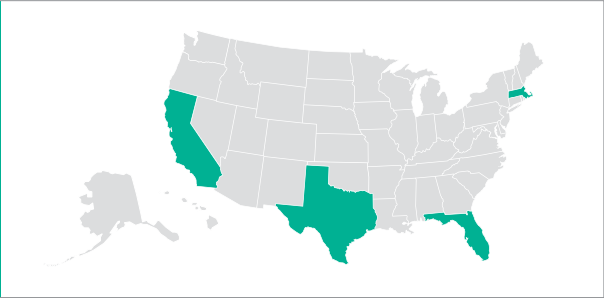


**“I mean the fact that you can move at night, where if you opened your eyes you wouldn’t be able to see me 10 feet away from you... but with a night vision I can see every detail about you. It’s a combat multiplier.”**

—SGT. Justin Pizzoferrato, Infantry squad leader, 101st Airborne

# Thermal Weapon Sight (TWS), AN/PAS-13

*Enables the Soldier to detect and engage targets, day or night, in all-weather and other obscurant conditions.*



The **AN/PAS-13 Thermal Weapon Sight (TWS)** enables Soldiers with individual and crew served weapons to see deep into the battlefield, increase surveillance and target acquisition range, and penetrate obscurants, day or night. The TWS systems use uncooled forward-looking infrared technology and provide a standard video output for training, image transfer, or remote viewing. Thermal weapon sights are lightweight systems that mount onto an M1913 weapon rail and operate to the maximum effective range of the weapon. The light TWS operates on four lithium AA batteries, while the medium and heavy TWS operate on six lithium AA batteries.

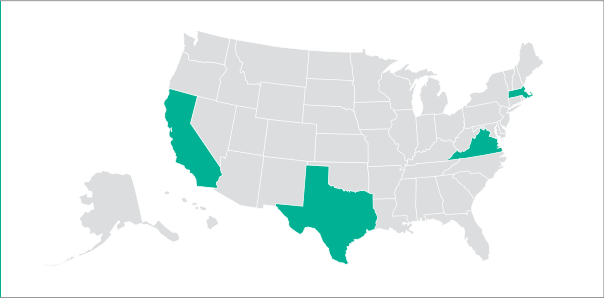


**Thermal Weapon  
Sight (TWS),  
AN/PAS-13**  
[Soldier Sensors & Lasers](#)



# Enhanced Night Vision Goggle (ENVG), AN/PSQ-20

*Provides the Soldier with enhanced situational awareness day or night in all weather and degraded battlefield conditions.*



The **AN/PSQ-20 Enhanced Night Vision Goggle (ENVG)** is a helmet-mounted passive device for the individual Soldier that combines scene data from image intensification and a long-wave infrared sensor into a single, integrated image. The ENVG improves the Soldier's situational awareness by providing the capability to rapidly detect and recognize man-sized targets while maintaining the ability to see detail and use weapon-mounted aiming lights.

A digital upgrade package for ENVG will take advantage of image processing techniques to improve image clarity and situational awareness for the Soldier. A digital system will lend itself to the battlefield of the future with the ability to import and export digital files (data/map injection).

The ENVG weighs two pounds, with four AA batteries, and provides target recognition ranges comparable to, or better than, the AN/PVS-14. The ENVG is compatible with the Multifunctional Aiming Lights currently in the Army inventory.

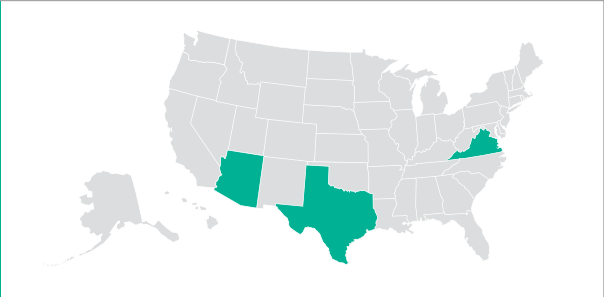


**Enhanced Night  
Vision Goggle  
(ENVG), AN/PSQ-20**  
[Soldier Sensors & Lasers](#)



# Monocular Night Vision Device (MNVD), AN/PVS-14

*Provides Soldiers with the capability to engage and execute close combat, combat support, and combat service support operations in very low (starlight) ambient conditions.*



The **AN/PVS-14 Monocular Night Vision Device (MNVD)** is a lightweight head- or helmet-mounted device that can also be mounted to the M16/M4 receiver rail. It is designed for use in conjunction with rifle-mounted aiming lights.

The AN/PVS-14 also incorporates an infrared (IR) illuminator with a momentary and continuous-on switching function. IR operation and low battery indicators are displayed within the Soldier's field of view. The AN/PVS-14 comes complete with a lightweight, fully adjustable military head strap that allows for comfortable long-term use. A wide range of optional accessories includes high-magnification lenses and a helmet-mounting bracket.

The field of view is  $\geq 40$  degrees, and the range is 150 meters. It operates on one AA battery for  $\geq 15$  hours and weighs .88 pounds.



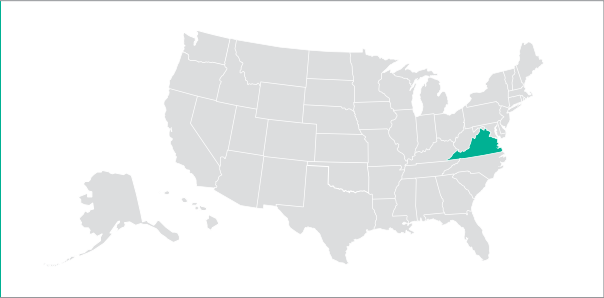
## Monocular Night Vision Device (MNVD), AN/PVS-14

Soldier Sensors & Lasers



# Aviator's Night Vision Imaging System (ANVIS), AN/AVS-6

*Enables aviators to operate more effectively and safely during low-light and degraded battlefield conditions.*



The **AN/AVS-6 Aviator's Night Vision Imaging System (ANVIS)** is a helmet-mounted, direct-view, third-generation, image-intensification device that allows flight operations under very low (starlight) ambient-light conditions. Power is supplied by a helmet-mounted, low-profile battery pack or from aircraft-supplied power.

The ANVIS has lenses that incorporate Class-A minus-blue filtering, which significantly reduces the radiance of the night sky. The ANVIS has been issued in several versions since its original fielding in the mid-1980s. The latest version incorporates improved image tubes capable of operating at near starlight conditions; 25mm eye relief; dual-span adjustment knobs; gated power supply; film-less or thin-film tube designs; fine-focus objective lens; and a low-profile battery pack.

The low-light sensitivity represents a 10 percent improvement over its predecessor and a 35 to 40 percent improvement over the earliest ANVIS. Additionally, the gated power supply enables operation at significantly higher light levels than any of the previous designs. All ANVIS systems are capable of operating for 24 hours on a pair of AA batteries.



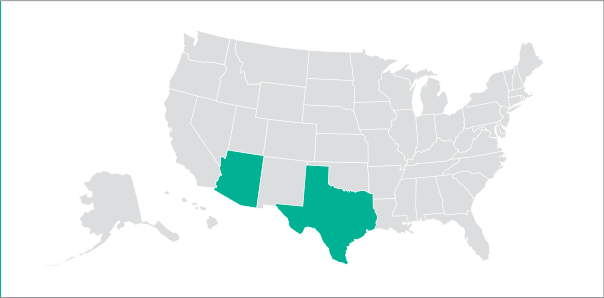
## Aviator's Night Vision Imaging System (ANVIS), AN/AVS-6

Soldier Sensors & Lasers



# Sniper Night Sight (SNS), AN/PVS-10

*Enables acquisition and engagement of targets using the M24 Sniper Weapon System and the M110 Semi-Automatic Sniper System.*



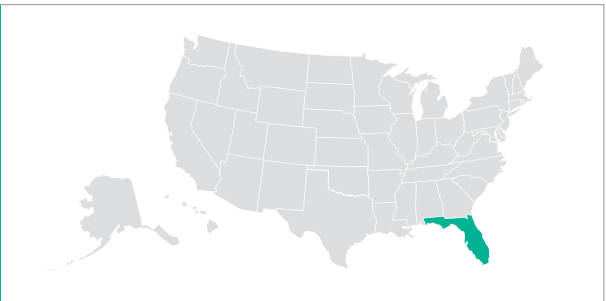
The **AN/PVS-10 Sniper Night Sight (SNS)**, originally issued in 1998, is a lightweight, weapon-mounted, self-contained, image-intensified passive device designed primarily for use by the sniper for day and night operations. It operates to a range of 600 meters at night or 800 meters during daylight. A day/night lever enables the user to alternate between day and night modes. The SNS employs a variable-gain image intensifier that can be adjusted depending on ambient light levels. The SNS includes a black-line reticle for day use, which can also be illuminated for night operation. An eyepiece diopter adjustment is provided so the SNS can be used without corrective glasses. A rail-mounting interface is integrated into the base of the sight to enable quick mounting or dismounting from the weapon. It is powered by two AA batteries.





# Clip-on Sniper Night Sight (Clip-on SNS), AN/PVS-26

*Enables the sniper to acquire and engage targets using the M110 Semi-Automatic Sniper System (SASS) during periods of limited visibility and at night.*



The **AN/PVS-26 Clip-on Sniper Night Sight (Clip-on SNS)** is a lightweight, clip-on, in-line weapon-mounted sight used in conjunction with the day optic sight on the M110 SASS. It is an image intensified passive device used by snipers. The Clip-on SNS employs a variable gain image tube that can be adjusted by the sniper depending on ambient light levels. When used in conjunction with the M110 day optical sight (DOS), it provides for personnel-sized target recognition at quarter moon illumination in clear air to a range of at least 600 meters. The Clip-on SNS system has an integrated mount adapter that interfaces directly to the MIL-STD 1913 rail for quick and easy attach/detach. It is powered by two AA batteries.

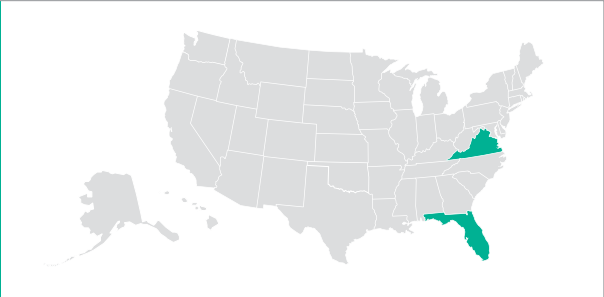
The Clip-on SNS allows a sniper to maintain his current level of accuracy with the M110 and to deliver precise fire within one minute of angle (1 MOA). Use of the Clip-on SNS does not affect the zero of the DOS and allows the M110 SASS to maintain boresight throughout the focus range of the Clip-on SNS and the M110 DOS.





# Laser Target Locating Systems (LTLS), Mark VII, Mark VII E (Enhanced), Vector 21

*Provides daylight and limited night capabilities to accurately locate targets for transmission of target data.*



The **Laser Target Locating Systems (LTLS)** are commercial off-the-shelf, handheld or tripod-mounted, lightweight laser target locators designed to deliver target data to the fire support command, control, communications, computer, and intelligence system.

The **MK VII** incorporates an eye-safe laser rangefinder and a digital, magnetic compass to determine range, azimuth, and vertical angle from the observer to targets of interest. When targeting data are sent to a Precision Lightweight Global Positioning System Receiver (PLGR), the system can compute and display target location. The MK VII can range tactical targets out to five kilometers (3.1 miles) on a seven-kilometer (4.45 miles) visibility day. The MK VII can locate targets to within 45 meters out to a range of five kilometers. An internal image intensifier is incorporated for night operations. Night capability to tactical targets is approximately 500 meters. The day optic is a 7.25-power monocular. Night optics provide 4-power capabilities. It operates on one 2CR5 lithium battery

The **MK VII E** is an improved MK VII, with 8-power day optic, an uncooled thermal sight for increased night performance (up to 900 meters), and an embedded GPS receiver for self and target location. It operates on eight DL123A lithium batteries.

The **Vector 21** integrates a Vector Binocular Laser Rangefinder (BLRF) with a PLGR to provide target grid coordinates. The Vector BLRF is rugged and waterproof and can locate targets to within 45 meters out to a range of four kilometers (2.5 miles) on a clear day. When used in conjunction with an AN/PVS-14, the Vector 21 provides a limited system night capability to 500 meters. The Vector 21 is powered by 1 3B35-TC lithium battery.

**Handheld weight:** MK VII - 4.2 pounds; MK VII E - 5.5 pounds; Vector 21 - 3.5 pounds

**Total system weight:** MK VII - 6 pounds; Vector 21 (daylight) - 5.9 pounds; Vector 21 (night) - 9.2 pounds



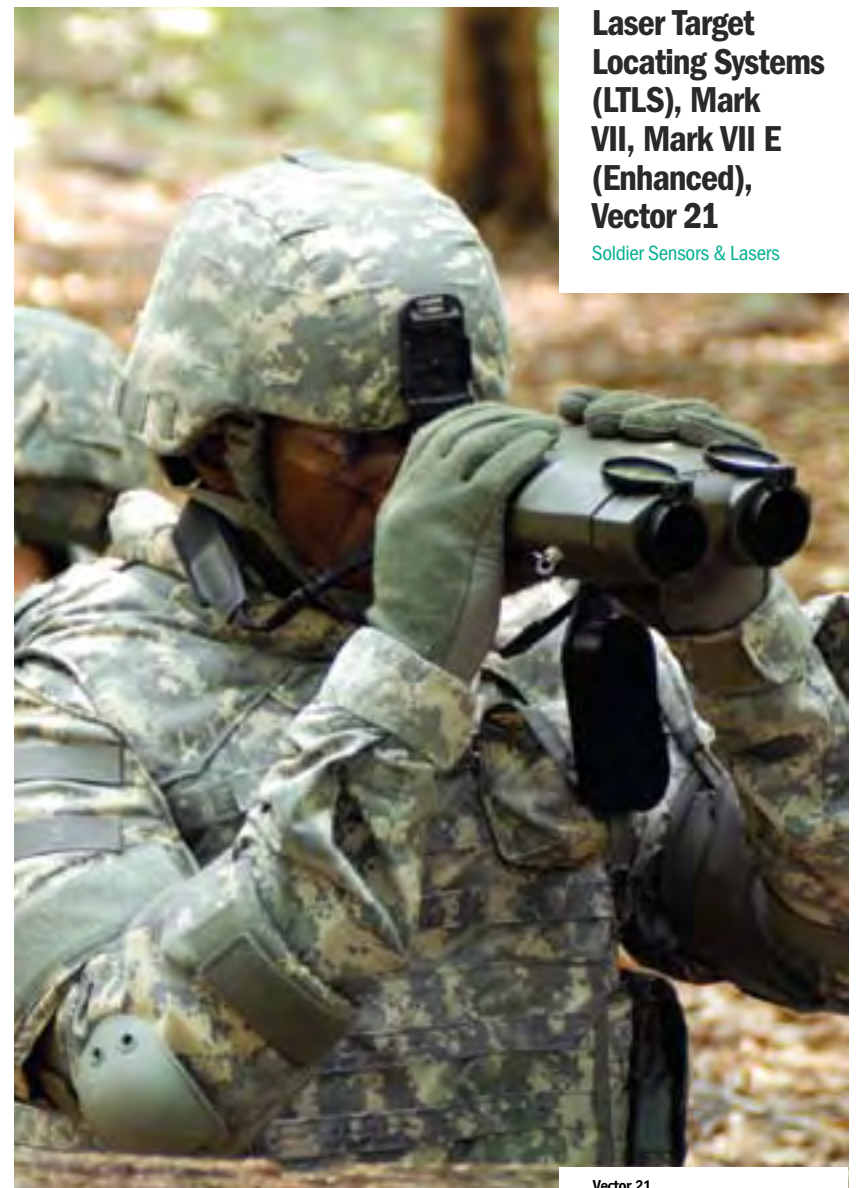
MK VII

**Laser Target  
Locating Systems  
(LTLS), Mark  
VII, Mark VII E  
(Enhanced),  
Vector 21**

Soldier Sensors & Lasers



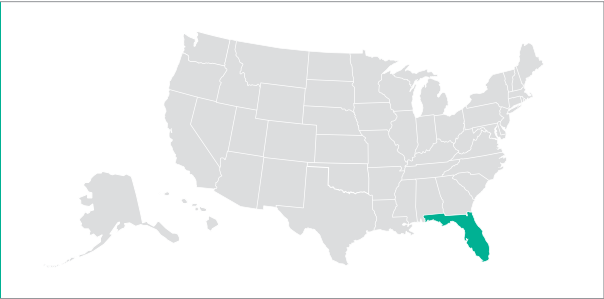
MK VII E



Vector 21

# Lightweight Laser Designator Rangefinder (LLDR), AN/PED-1

*Provides capability to accurately locate targets, digitally transmit target location data to the tactical network, and laser-designate high-priority targets with precision munitions.*



The **AN/PED-1 Lightweight Laser Designator Rangefinder (LLDR)** is a man-portable, modular target locator and laser designation system. The two primary components are the Target Locator Module (TLM) and the Laser Designator Module (LDM). The TLM can be used as a stand-alone device or in conjunction with the LDM. For conduct of a 24-hour mission, the total system weight is 35 pounds.

The TLM incorporates a thermal imager, day camera, electronic display, eye-safe laser rangefinder, digital magnetic compass, Selective Availability Anti-Spoofing Module (SAASM), Global Positioning System (GPS) electronics, and digital export capability. The TLM has an integral capability for boresighting with the LDM, enabling the operator to see the laser spot and align the system. The LDM emits coded laser pulses compatible with Department of Defense and North Atlantic Treaty Organization laser-guided munitions. The LLDR is highly accurate and operable during the day, at night, and in obscured battlefield conditions. It operates on one BA-5699 battery, but it can also image and determine far target location using a SINGARS battery.



**Lightweight  
Laser Designator  
Rangefinder  
(LLDR), AN/PED-1**

Soldier Sensors & Lasers



# Small Tactical Optical Rifle Mounted (STORM) Micro-Laser Rangefinder (MLRF), AN/PSQ-23

*Enables determination of distant target and terrain locations with laser rangefinding and digital direction finding.*



The **AN/PSQ-23 Small Tactical Optical Rifle Mounted (STORM) Micro-Laser Rangefinder (MLRF)** is a lightweight (1.2 pounds), multifunctional laser system designed to operate on individual and crew served weapons. It combines the functionality of a laser rangefinder, the AN/PEQ-2A Aiming Light, the Multiple Integrated Laser Engagement System (MILES), a digital compass and a visible pointer into a single package. Combined with a Precision Lightweight GPS Receiver (PLGR) or a Defense Advanced GPS Receiver (DAGR), the system can compute and display highly accurate target locations. It is powered by two DL-123 batteries.



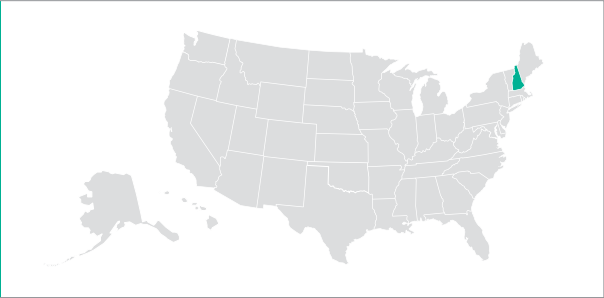
**Small Tactical  
Optical Rifle  
Mounted (STORM)  
Micro-Laser  
Rangefinder  
(MLRF),  
AN/PSQ-23**

Soldier Sensors & Lasers



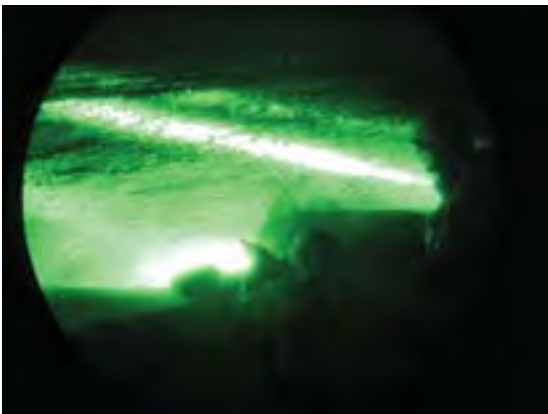
# Integrated Laser/White Light Pointer (ILWLP), AN/PEQ-14

*Enables Soldiers to acquire and engage targets in conditions of limited visibility or darkness using either unaided vision or night vision devices.*



The **AN/PEQ-14 Integrated Laser/White Light Pointer (ILWLP)** combines the functions of a flashlight, visible aiming laser, an infrared (IR) aiming laser, and an IR illuminator into a single lightweight system.

The ILWLP weighs six ounces and attaches to the M9 pistol with a MIL-STD-1913 rail adapter and uses two DL 123 standard commercial disposable batteries. It has a visible aiming laser range of 25 meters in daylight, and flashlight with facial recognition out to 20 meters in dark conditions. The ILWLP has IR aiming and illumination capability of up to 100 meters, well beyond the maximum effective range of the weapon.



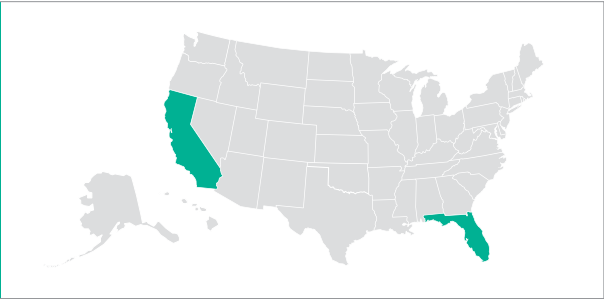
**Integrated Laser/  
White Light Pointer  
(ILWLP),  
AN/PEQ-14**

Soldier Sensors & Lasers



# Sense Through The Wall (STTW), AN/PPS-26

*Provides the Soldier with the capability to detect, locate, and “sense” personnel with concealed weapons/explosives behind obstructions from a standoff distance.*



The **AN/PPS-26 Sense Through The Wall (STTW)** system will enable Soldiers and small units to dominate conventional and asymmetrical threats in close combat and close, complex terrain through improved situational awareness (SA), command and control (C2), embedded training (ET), lethality, mobility, survivability, and sustainability. The SA and C2 will enhance troop leading procedures, tactical problem solving, and operational momentum. The STTW system will enable small units to influence a larger geographic area with greater speed and increased lethality while maximizing force protection and minimizing noncombatant casualties. The STTW devices will be used through exterior and interior walls, floors, or ceilings, to accurately detect targets both moving and stationary through walls, including 8-inch reinforced concrete, while being operated with or without operator standoff. The handheld STTW system will provide a real-time SA capability to the individual Soldier in built-up areas. It is powered by six AA batteries.

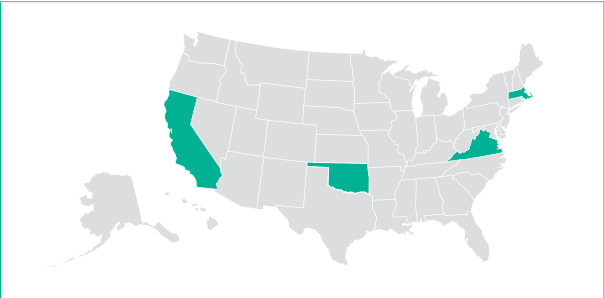


**Sense Through The  
Wall (STTW),  
AN/PPS-26**  
Soldier Sensors & Lasers



# Soldier Worn Gun Fire Detection System (GFDS)

*Improves Soldier survivability by enabling the Soldier to accurately determine the direction and range of gunfire in order to terminate the threat.*



**Soldier Worn Gun Fire Detection System (GFDS)**  
technologies are self-contained passive acoustic systems with the capability to detect and localize the source of small arms fire. The system is tuned to detect shockwave and muzzle blast signatures while screening out other acoustic events. The technologies use information from both the shockwave of a bullet and the muzzle blast from the corresponding rifle fire either as a single sensor or a distributed networked sensor array to alert the user of the threat. These systems provide range and bearing calculations out to 400 meters with a bearing error less than plus or minus 7.5 degrees of the actual bearing. The single sensor system (SWATS, Boomerang Light) reports this solution directly to the individual Soldier on a visual display within a second after the muzzle blast. It can also use audio to report bearing and range information. The distributed network sensor array (ShotSpotter, GWACS) triangulates the position of the hostile fire and then sends it to a PDA at the squad or platoon level. Both technologies are able to detect and provide alert data for variants of both 5.56mm and 7.62mm sized ammo. The system is powered by two DL123 batteries.



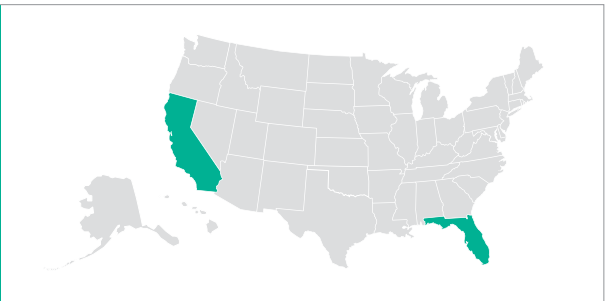
## Soldier Worn Gun Fire Detection System (GFDS)

Soldier Sensors & Lasers



# Family of Flashlights (FoF) Weapons Mounted Light (WML)

*Provides a small, lightweight, weapon-mounted or hand-held white light capability for use in a variety of combat situations.*



The **Weapons Mounted Light (WML)** is one of the four components of the **Family of Flashlights (FoF)**. The others are the Tactical Handheld Light, the Hands Free Helmet Light, and the Crew Served Weapons Light. The WML is a small (seven inches or less), lightweight (ten ounces or less with batteries) white light that can be weapon-mounted or hand-held. The WML is employed on small arms weapons including the M16A4 modular weapons, M4/M4A1, M249 (Threshold), and M240B (Objective). The light is able to mount on the weapons' U.S. Army Standard Rail (MIL-STD-1913) and does not interfere with day/night optics, aiming lights, or other weapon accessories. When weapon-mounted, the WML will provide the Soldier the capability to illuminate a 20 x 30 x 8 foot darkened room or enclosure and identify targets accurately (facial recognition at a range of 20 meters [Threshold], 25 meters [Objective]). The WML has dual activation controls, i.e., an on/off switch located on the device housing and a wired remote control switch. The system operates on two DL123 batteries. The WML includes an infrared capability.



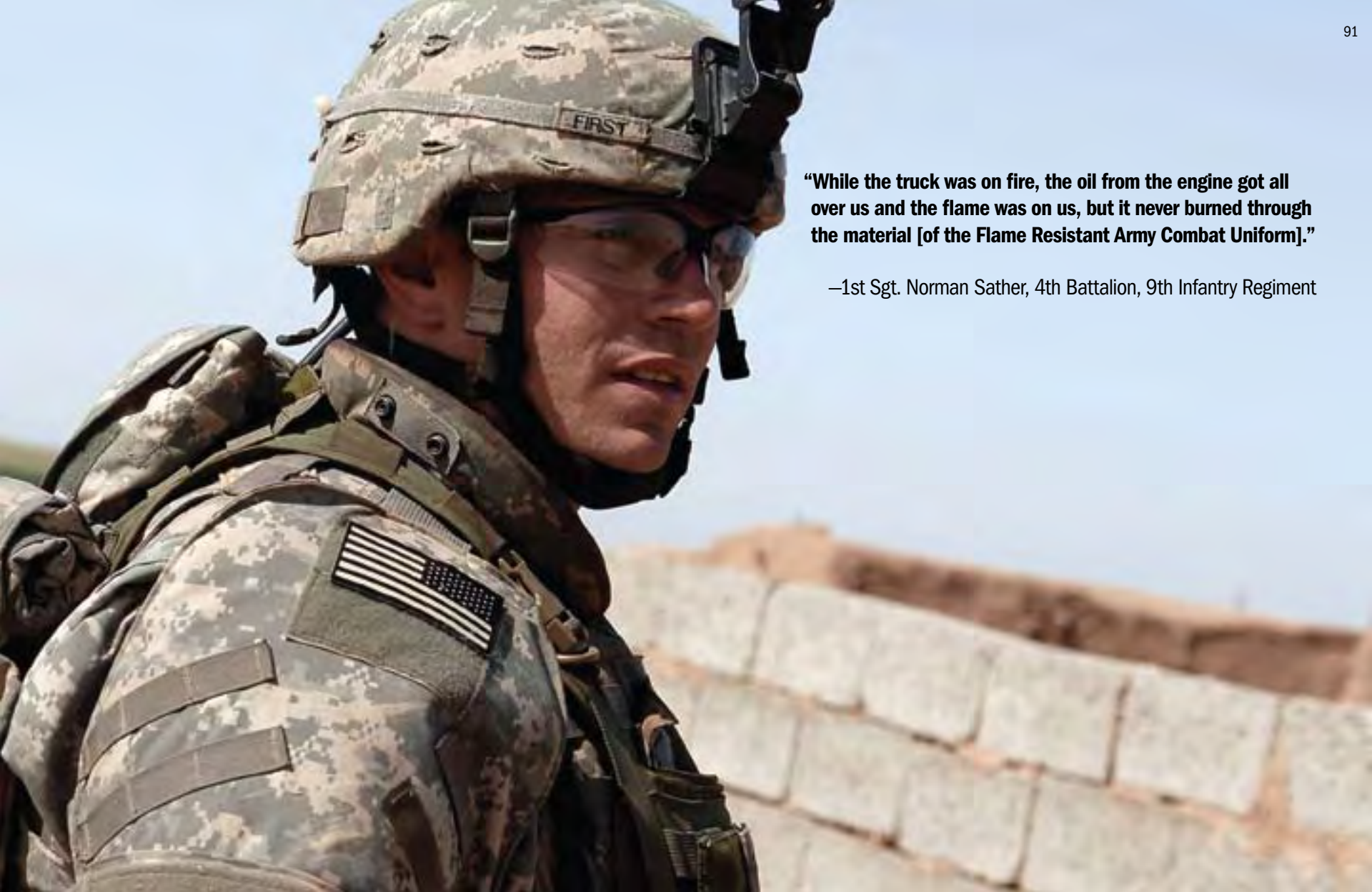
## Family of Flashlights (FoF) Weapons Mounted Light (WML)

Soldier Sensors & Lasers



**Product Manager Clothing and Individual Equipment (PM CIE)** provides comfortable uniforms that enhance mission effectiveness. These products protect against manmade threats, such as fire and biological/chemical agents, as well as environmental threats, such as extreme weather conditions. PM CIE also provides improved parachute systems.

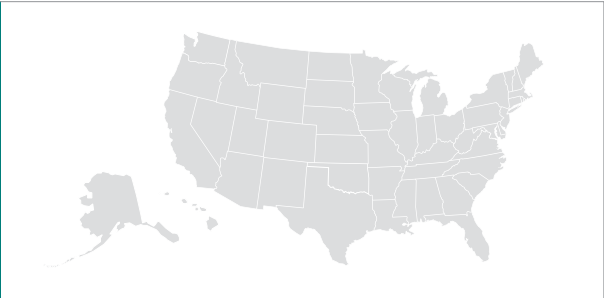




**“While the truck was on fire, the oil from the engine got all over us and the flame was on us, but it never burned through the material [of the Flame Resistant Army Combat Uniform].”**

**—1st Sgt. Norman Sather, 4th Battalion, 9th Infantry Regiment**

*Provides a basic set of components, allowing the Soldier to dress from the lowest to the highest end of service uniforms with little variation required, reducing the need for numerous uniforms.*



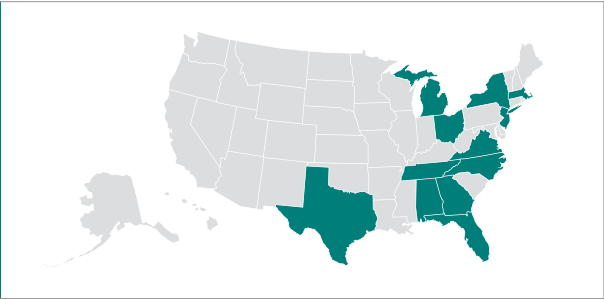
The **Army Service Uniform (ASU)** reflects simplicity, quality, utility, and tradition. Streamlining various dress uniforms into one ASU reduces the burden on the Soldier. The ASU is based on the Army Blue Uniform. The designs of the men’s and women’s Army Blue Uniform coats remain unchanged. The belted trousers and slacks with a traditional low waistline will be available for daily wear. The high waist men’s trousers traditionally worn with suspenders will be retained for wear with the Army Mess Dress Uniform. The men’s coat, women’s coat, women’s skirt, General Officer trousers, and slacks are shade Army Blue 450. The Enlisted and Officer/Non-Commissioned Officer men’s trousers and women’s slacks are shade Army Blue 451.

The ASU is made of durable materials that do not require special care. The ASU coat, trousers, slacks, and skirt fabric is a 55 percent polyester and 45 percent wool blend. A new white herringbone shirt will be for daily wear, and commercial off-the-shelf white dress shirts will be worn for ceremonial and formal occasions. The herringbone shirt fabric is 65 percent polyester and 35 percent cotton. Officers and Non-Commissioned Officers (corporal and above) will wear gold stripes on the trouser/slacks. Enlisted Soldiers (specialist and below) will have plain legs on the trousers/slacks. Enlisted Soldiers will wear new smaller service stripes on the left coat sleeve. One service stripe is worn for every 3 years of honorable service. Officers and enlisted Soldiers will wear overseas service bars on the right coat sleeve. One overseas service bar is authorized for 6 months of overseas service in designated areas during specified periods. The current black accessories, such as the windbreaker, all-weather coat, overcoat, and sweaters, may be worn with the ASU.



# Personal/Optional Clothing and Equipment

*Provides a variety of standard issue and new clothing, insignia, and personal equipment to enhance fit, comfort, alterability, and appearance.*



The **Beret** is a one-piece, unlined wool shell with a leather headband, draw cord, and lined badge-stay for attachment of insignia. The standard beret is black. Airborne Soldiers wear maroon berets, Special Forces wear green, and Rangers wear tan berets. The beret is standard-issue headgear.

The **All-Weather Coat** functions as a raincoat and a topcoat; double-breasted with a six-button front; set-in sleeves; pointed, button-down shoulder and sleeve straps; a front gun patch flap; two vertical welt pockets with pass-through slits; belt; center back pleat vent and half cape back; in black polyester/cotton blend.

The **Overcoat** is optional; it is warmer and dressier than the All-Weather Coat.

The **Men's Green Class A Service Uniform** includes a coat, trousers, a shirt, necktie, belt, and buckle.

The **Women's Class A Uniform** includes slacks, a skirt, coat, shirt, neck tab, belt, and buckle.

The **Men's Class B Service Uniform** omits the coat and tie if the short-sleeve shirt is worn.

The **Women's Class B Service Uniform** is redesigned to improve fit, comfort, alterability, and appearance. It omits the coat or coat and neck tab, depending upon the shirt worn.

The **Maternity Cardigan Sweater** is optional; worn with maternity service uniforms; V-neck cardigan, longer in front than in back, has elbow and shoulder patches, epaulets with hook-and-loop attachments, and a six-button front.

The **White Cardigan Sweater** is optional; V-neck cardigan design with a rib knit trim around the front opening and neckline, rib knit cuffs, two lower front pockets, and a six-button front.

The **Poromeric Oxfords** are plain-toed shoes with removable cushioned insoles, skid-resistant soles, and breathable comfort lining.

## Personal/Optional Clothing and Equipment

Clothing & Individual Equipment



Beret



All-Weather Coat



Poromeric Oxfords



White Cardigan Sweater

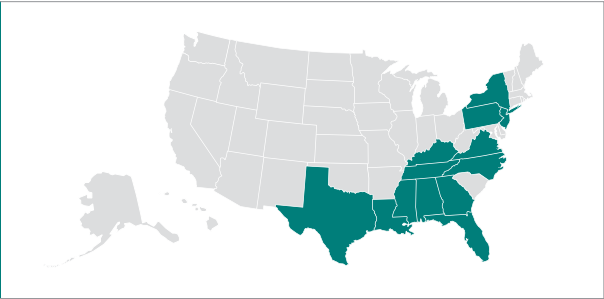


Men's &amp; Women's Class A Uniform



Maternity Cardigan Sweater

*Enhances mission performance with a functional uniform that can be tailored to situational demands.*



The **Army Combat Uniform (ACU)** is the product of months of research and development by Soldiers for Soldiers. Throughout the design and evaluation process, Soldiers were directly involved in the ACU construction. The result is a combat uniform with improved functionality and greater Soldier acceptance than the Battle Dress Uniform (BDU). The ACU consists of a coat, trousers, and patrol cap in a universal camouflage pattern, moisture-wicking T-shirt, and improved hot-weather and temperate-weather Army combat boots.

The ACU enhances Soldier performance because it can be tailored to the individual mission, provides enhanced functionality and ergonomics over the BDU and Desert Camouflage Uniform (DCU), and does away with requirements to procure uniforms focused on specific environments. The ACU fabric is a 50 percent cotton/50 percent nylon blend, ripstop poplin that is treated to be wrinkle-free.

The **Flame Resistant ACU (FR ACU)** has the same design as the ACU but is made of advanced flame-resistant fabrics. The FR ACU is identified by a tab of green webbing sewn to the left sleeve cuff and left leg cargo pocket flap.

## Army Combat Uniform (ACU)

Clothing & Individual Equipment



# Army Aircrew Combat Uniform (A2CU)

*Enhances aircrew comfort and provides flash fire protection during pre-flight, flight, post-flight, refueling, and other aviation operations.*



The **Army Aircrew Combat Uniform (A2CU)** is a two-piece flight suit in the universal camouflage pattern that offers the Soldier protection from flash fires. The coat is similar to the ACU in design, with a stand-up collar featuring a front extension, shoulder patches, a front zipper, two inside hanging chest pockets with flaps; adjustable waist; two-piece set-in sleeves with elbow patches; two sleeve utility pockets with flaps and Identification Friend or Foe (IFF) tabs; and two lower sleeve pencil pockets with flaps. It can be worn with the Air Warrior Microclimate Cooling Vest. The trousers have nine pockets: two thigh pockets; two calf pockets with external tool pockets; one knife pocket with lanyard (on the left thigh); and two side hanging pockets. Pockets (except for the side hanging pockets and the lower leg external tool pockets) have flaps and zippers.

The A2CU upgrades the current aviation protective clothing system to improve operational effectiveness, fit, suitability, and durability, addressing near-term Air Warrior requirements and adding the universal camouflage pattern. The A2CU is made of a blend of 92 percent Nomex, 5 percent Kevlar, and 3 percent static dissipative fiber.



## Army Aircrew Combat Uniform (A2CU)

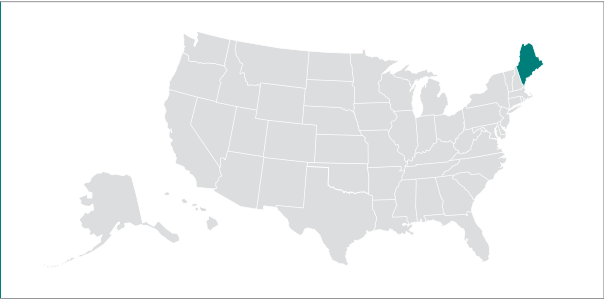
Clothing & Individual Equipment



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# Improved Combat Vehicle Crewman (iCVC) Coverall

*Provides combat vehicle crewmen with extraction capability and improved protection from flame and flash fires in all weather conditions.*



The **Improved Combat Vehicle Crewman (iCVC) Coverall** is a one-piece flame-resistant garment with a front entry, zippered closure with dual sliders. It has a drop seat, upper back extraction strap, collar with front throat protection, zippers on the sleeves and legs, and nine pockets. The coverall is a blend of inherent flame-resistant fibers (Nomex/Kevlar), synthetic fibers (nylon), cellulosic fibers (cotton) and static dissipative fibers (P-140). It is available in the universal camouflage pattern.

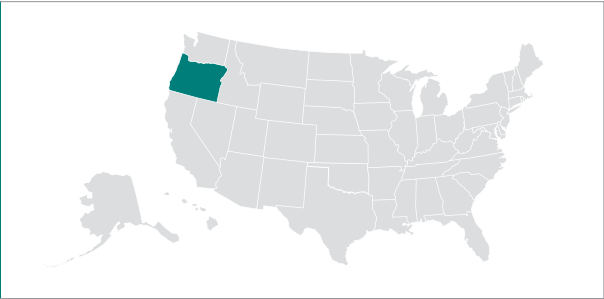


## Improved Combat Vehicle Crewman (iCVC) Coverall

Clothing & Individual Equipment



*Provides the Soldier improved comfort and enhanced flame and thermal protection.*



The **Army Combat Shirt (ACS)** is a flame-resistant (FR) shirt. The torso is made of a highly breathable moisture-wicking cotton/rayon/polyester/spandex blend and a modesty panel blended with cotton/rayon/spandex. Both fabrics significantly increase moisture vapor transmission, heat stress relief, and comfort when worn with the Interceptor Body Armor. The sleeves are in the universal camouflage pattern and have cargo pockets, infrared identification tags, hook and loop fasteners for the American flag, and integrated anti-abrasion elbow pads. The shirt also features seamless shoulders and side panels for comfort and is treated using a state-of-the-art flame-resistant process that fuses to the fibers. It is washable and maintains its flame resistance for the life of the garment.



## Army Combat Shirt (ACS)

Clothing & Individual Equipment



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# Infrared Retroreflective (IR) Flag

*Helps Soldiers identify friendly forces when near infrared vision systems are required.*



The **Infrared Retroreflective (IR) Flag** is an attachable patch that enables the identification of friendly forces. The flag becomes visible in dark environments when observed with near infrared vision systems, such as Night Vision Goggles and near infrared illuminators. The IR Flag is made of micro-prismatic, retroreflective black polymeric film contrasted with opaque Desert Sand stars and stripes. The IR Flag, which is 3.5 inches long by 2 inches wide, is secured to military uniforms with hook fastener tape.



## Infrared Retroreflective (IR) Flag

Clothing & Individual Equipment



# Fire Resistant Environmental Ensemble (FREE)

*Provides combat vehicle crews and aviation crews with flame protection in a variety of cold and wet climates.*



The **Fire Resistant Environmental Ensemble (FREE)** is a multilayered, versatile insulating system that is adaptable to varying mission requirements and environmental conditions. The system consists of male and female undergarments, a base layer, midweight under layer, light weather outer layer, intermediate weather outer layer, and an extreme/wet weather parka. It also includes cold weather gloves, a rigger belt, and wool socks.

FREE is designed to be functional in and out of aircraft and combat vehicles. It will replace aviation and combat vehicle crewmen cold-weather clothing. Additionally, it is designed to increase comfort and ergonomic efficiency for wear in the confines of aircraft and armored vehicles.



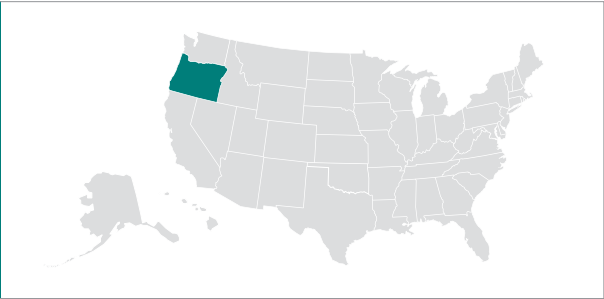
# Fire Resistant Environmental Ensemble (FREE)

Clothing & Individual Equipment



Note: The photos are of the two finalist systems

*Provides enhanced flame-resistant clothing system to aviators.*



The **Army Elements Fleece (AEF)** is a versatile, insulating layer allowing aviation crews to adapt to varying mission requirements and environmental conditions.

The primary fabric has an integrated Nomex fleece inner surface to insulate the Soldier against cold temperatures. The fabric is waterproof and windproof, but also breathable, to protect the Soldier in inclement weather including wind, rain, sleet, and snow. Outer layer is printed in the universal camouflage pattern. The inner Nomex fleece layer is foliage green.



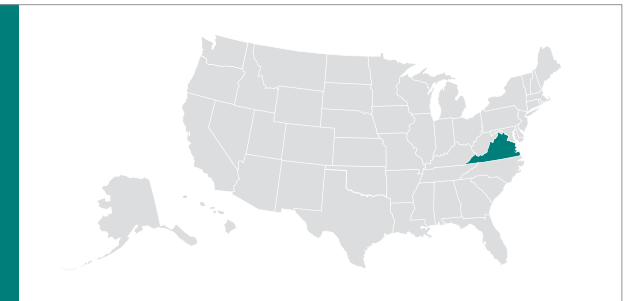
## Army Elements Fleece (AEF)

Clothing & Individual Equipment



# Generation III Extended Cold Weather Clothing System (GEN III ECWCS)

*Protects the Soldier from cold weather conditions with clothing adjustable to the Soldier's personal preference and prevailing weather conditions.*



The **Generation III Extended Cold Weather Clothing System (GEN III ECWCS)** is a multilayered, versatile, insulating system that allows the Soldier to adapt to varying mission requirements and environmental conditions. The modularity of the system is based on the mission and the individual requirement of the Soldier. It is designed to be broken down into several possible configurations.

GEN III ECWCS consists of 12 components:

**Lightweight Cold Weather Undershirt/Drawers:** These consist of long-sleeve top and full-length bottom garments constructed of “silk weight” moisture-wicking polyester. The fabric aids in the movement of moisture from the skin to the outer layers while the Soldier is moving or static.

**Midweight Cold Weather Shirt/Drawers:** These consist of long-sleeve top and full-length bottom garments constructed of polyester “grid” fleece. They provide light insulation for use in mild climates and also act as a layer for colder climates. They provide an increased surface area for transporting moisture away from the Soldier during movement.

**Fleece Cold Weather Jacket:** This jacket acts as the primary insulating layer for use in moderate to cold climates. Insulation mimicking animal fur provides an increase in the warmth-to-weight ratio along with a reduction in volume when packed.

**Wind Cold Weather Jacket:** This jacket acts as a low-volume shell layer, optimizing the performance of moisture-wicking and insulation layers when combined with Interceptor Body Armor and/or the Army Combat Uniform (ACU) in mild to transitional environments such

as desert day to desert evening. It is made of a lightweight, windproof, and water-repellent material. Design features include full-zip front, draw cord at the bottom, shoulder pockets, and a no-hood simple collar.

**Soft Shell Cold Weather Jacket and Trousers:** These replace the ACU in extended cold weather environments. They are made of a highly water-resistant, windproof material that increases moisture vapor permeability over current hard-shell garments. The garments reduce weight, bulk, and noise signature during movement. Increased breathability improves performance of insulation layers by decreasing saturation from moisture vapor accumulation.

**Extreme Cold/Wet Weather Jacket and Trousers:** These include a waterproof layer for use in prolonged and/or hard rain and wet conditions.

**Extreme Cold Weather Parka/Trousers** provide superior warmth and high compactability, low weight and low volume, and are sized to fit over armor and basic load carriage equipment (not zipped up) during movement or static activities requiring maximum insulation. They are highly water-resistant and windproof.

Lightweight Cold  
Weather Undershirt/  
Drawers

Midweight Cold  
Weather Shirt/Drawers

Fleece Cold  
Weather Jacket

Wind Cold  
Weather Jacket

Soft Shell Cold Weather  
Jacket and Trousers

Extreme Cold/Wet Weather  
Jacket and Trousers

Extreme Cold Weather  
Parka/Trousers

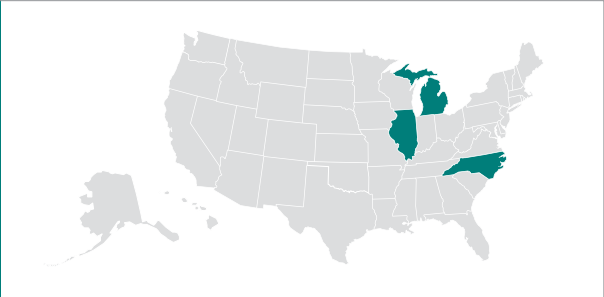


## Generation III Extended Cold Weather Clothing System (GEN III ECWCS)

Clothing & Individual Equipment



*Provides combat personnel with environmental and camouflage foot protection in a variety of battlespace environments.*



The **Army Combat Boot (Temperate Weather)** is a tan-colored, temperate weather combat boot with a moisture-resistant, rough-side-out cowhide leather and nylon duck upper. It contains a waterproof breathable membrane and integrated safety features for limited flame-, conductive heat-, and liquid fuel penetration-protection. The sole consists of a three-layer, shock absorbing soling system with an abrasion- and slip-resistant solid rubber outsole. It has a combination eyelet and speed-lace lacing system.



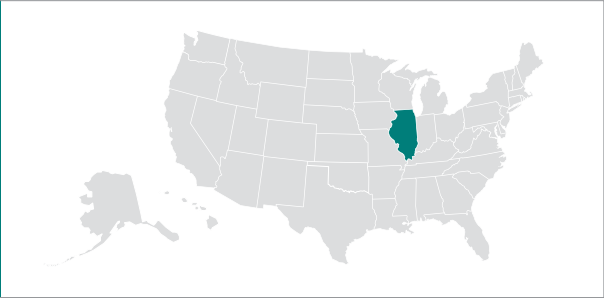
## Army Combat Boot (Temperate Weather)

Clothing & Individual Equipment



# Cold (Wet and Dry) Weather and Specialty Boots

*Provides the Soldier with environmental foot protection suitable for wet and dry cold weather conditions.*



The **Extreme Cold Weather Boot (ECWB)** protects feet in dry-cold conditions between minus 20 degrees Fahrenheit and 60 degrees Fahrenheit. Boots have six pairs of eyelets and insulation consisting of three layers of needle-punched polyester foam hermetically sealed within an outer and inner layer of rubber. The boot has a pressure-release valve to adjust internal air pressure in the boot during high-altitude operations.

The **Intermediate Cold Wet Boot with Removable Liner (ICWB w/RL)** is a tan, cold-wet weather combat boot with a moisture-resistant, rough-side-out cowhide leather upper measuring 10 inches in height. Boots are worn in cold, wet environments where the mean monthly temperature ranges between 14 and 32 degrees Fahrenheit. This boot contains a waterproof breathable membrane and is issued with two pairs of insulated removable booties. It has a shock-attenuating soling system with a slip- and abrasion-resistant rubber outsole. It has a combination eyelet and speed-lace lacing system.

The **Modular Boot System (MBS)** is a multifunctional, multi-theater footwear system that will afford the Soldier environmental protection and added capability in environmental conditions ranging from minus 20 to 110 degrees Fahrenheit. It is a developmental program designed to replace the current ACB (HW), ACB (TW), ICWB w/RL and black Cold Weather Boot, which has already been phased out.



# Cold (Wet and Dry) Weather and Specialty Boots

Clothing & Individual Equipment

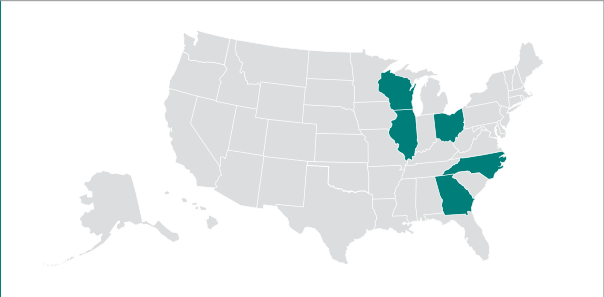


Extreme Cold Weather Boot (ECWB)

Intermediate Cold Wet Boot with Removable Liner (ICWB w/ RL)

# Hot (Wet and Dry) Weather Boots

*Provides the Soldier with environmental and camouflage protection in wet and dry hot weather battlespace environments.*



The **Army Combat Boot (Hot Weather) [ACB (HW)]** is a tan-colored, hot weather combat boot made with moisture-resistant, rough-side-out cowhide leather and nylon duck upper with two drainage eyelets on the inner arch. The sole of this boot consists of a three-layer, shock-absorbing soling system with a solid rubber, abrasion-resistant outsole. It has a combination eyelet and speed-lace lacing system.

The **Army Combat Boot (Hot Weather–Flame Resistant) [ACB (HW-FR)]** is a tan-colored, flame- and conductive heat-resistant hot weather combat boot made with moisture-resistant, rough-side-out cowhide leather and fabric upper designed for U.S. Army Flight personnel and Combat Vehicle Crewmen. The sole of this boot consists of a three-layer, shock-absorbing soling system with a solid rubber, abrasion-resistant outsole. It has a combination eyelet and speed-lace lacing system.

The **Army Combat Boot (Hot Weather–Safety Toe) [ACB (HW-ST)]** is the safety toe version of the ACB (HW). It is a tan-colored, hot weather combat boot made with moisture-resistant, rough-side-out cowhide leather and nylon duck upper. The sole of this boot consists of a three-layer, shock absorbing soling system with an abrasion-resistant solid rubber outsole. It has a combination eyelet and speed-lace lacing system and contains an ASTM F13-compliant steel toe.



Army Combat Boot (Hot Weather-Flame  
Resistant) [ACB (HW-FR)]



Army Combat Boot (Hot Weather-Safety Toe)  
[ACB (HW-ST)]



Army Combat Boot (Hot Weather) [ACB (HW)]

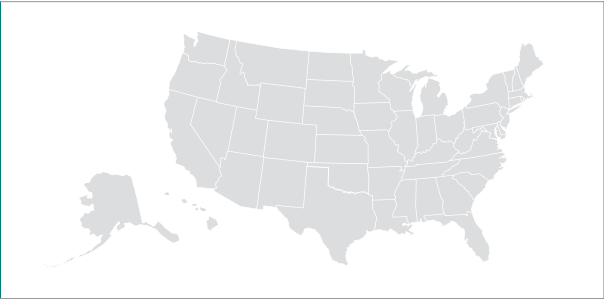


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# Intermediate Cold Wet Glove (ICWG)

*Protects Soldiers' hands in intermediate environmental conditions.*

The waterproof **Intermediate Cold Wet Glove (ICWG)** protects hands in environmental conditions with temperatures of approximately 0 to 40 degrees Fahrenheit. The recently improved ICWG now features less bulky insulation in the trigger finger to increase dexterity. The new glove has eliminated the flexor design and has multiple waterproof/breathable membranes. The ICWG is worn alone or over lightweight inserts.



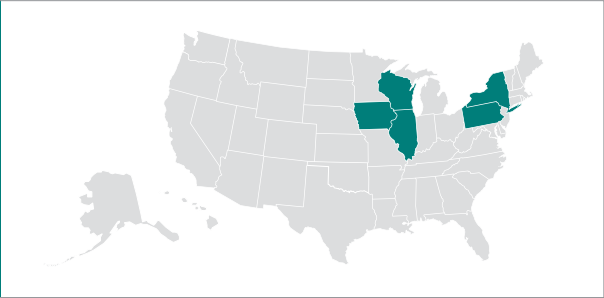
## Intermediate Cold Wet Glove (ICWG)

Clothing & Individual Equipment



# Cold (Wet and Dry) Weather Gloves

*Provides the Soldier with full cold weather hand protection and camouflage for wet and dry environments.*



**Men’s and Women’s Anti-Contact Gloves** protect against cold burns caused by contact with cold metal objects and provide extra protection and comfort when performing tasks requiring dexterity. The unlined Gunn-cut gloves are made of fabric and have leather palms.

**Intermediate Cold Weather (ICW) Flyer’s Gloves** are designed to protect against flash flames and cold weather. Nomex knit fabric protects the back of the hand, and black sheepskin leather protects the inside of the hand from palm to fingertips.

**Cold Weather Glove Inserts**, for both left and right hands, are made of knitted wool and are designed to be worn under gloves to provide extra protection from the cold.

**Extreme Cold Weather (ECW) Mitten Set** is worn over other handwear to provide extra protection in extremely cold climates. In situations requiring dexterity where the mittens must be temporarily removed, the Soldier can easily secure the mittens with the included suspension harness. The ECW Mitten Set includes the outer shells, removable insulation, and a cotton tape and cotton braid suspension harness. The outer shells of the mitten set are made of wind-resistant and water-repellent cotton, have nylon sateen and deerskin leather palms, and have wool pile material on the backs of the hands. The removable insulating liner is made of polyester batting with a lightweight ripstop nylon cover fabric. The mittens have a long gauntlet with adjustable closure straps across the top of the wrist and the top of the gauntlet.

**Snow Camouflage White Mitten Shells**, worn over ECW mittens and trigger finger mittens for camouflage in snowy terrain, are made of a single layer of fabric and have long gauntlets with an elastic take-up at the top. These camouflage mitten shells are made of cotton warp and nylon filling oxford cloth, have a water-resistant finish, and have an adjustable closure strap across the top of the wrist.

**Cold Weather Trigger Finger Mitten Shells**, which slip on, are worn in temperatures too cold for leather gloves. They are knit with leather palms, thumb compartments, and combined second, third, and fourth finger compartments. The mitten shells have long gauntlets with elastic around the top, a tape loop at the top for attaching a suspension cord, and an adjustable closure strap on the back across the wrist. The mitten shells have insulation across the backs of the hand and around the fingers. The hands have a plain stitch knit and the cuffs are rib knit. The shells can be worn with or without the Cold Weather Trigger Finger Mitten Inserts. The green inserts are knitted fabric and have the same finger configuration as the Trigger Finger Shell.

# Cold (Wet and Dry) Weather Gloves

Clothing & Individual Equipment



Intermediate Cold Weather (ICW) Flyer's Gloves



Men's and Women's Anti-Contact Gloves



Cold Weather Glove Inserts



Snow Camouflage White Mitten Shells



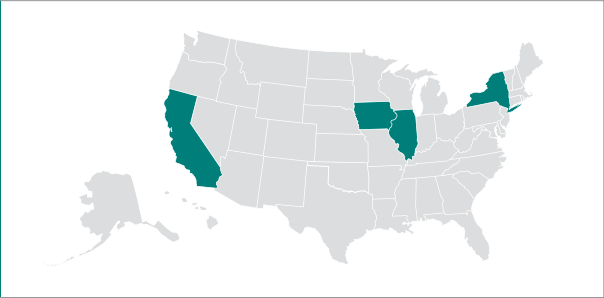
Extreme Cold Weather (ECW) Mitten Set



Cold Weather Trigger Finger Mitten Shells

# Hot (Wet and Dry) Weather Gloves

*Protects the Soldier's hands when moving objects and navigating rough terrain.*



The **Combat Glove** is 96 percent Kevlar and 4 percent P140 conductive anti-flash fiber. The glove is form fitting, offering maximum dexterity and tactility. The back of the hand and the fingers of the glove are made of a unique knit blend, increasing cut and flame protection. The leather is hair sheepskin or goat kidskin. Thread materials are 100 percent Kevlar, as classified under MIL-A-A-55195. The Kevlar cloth portion of the gloves provides flame-resistance and does not melt or drip. The gloves can be laundered without losing their protective properties.

The **Combat Vehicle Crewman's (CVC) Glove** and the **Summer Flyer's Glove** are lightweight, unlined cloth and leather gloves. The CVC Glove is made of flame-resistant jersey knit Nomex and has leather palms made of water-resistant cattlehide or horsehide. The Summer Flyer's Glove is made of flame-resistant jersey knit Nomex with palms made of water-resistant leather. Both gloves can be laundered without losing their flame resistance.

## Hot (Wet and Dry) Weather Gloves

Clothing & Individual Equipment



Combat Vehicle Crewman's (CVC) Gloves

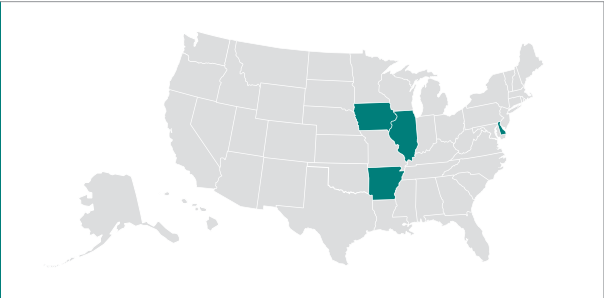


Combat Gloves



Summer Flyer's Gloves

*Protects the Soldier's hands in a variety of potentially dangerous situations, settings, and temperatures.*



**Barbed Wire Handlers' Gloves** protect the Soldier's hands when they must handle barbed tape, barbed wire, and other similar materials. The gloves have a four-finger-and-thumb Clute design with a 5-inch gauntlet. The split-leather cowhide palms are lined with cotton flannel, and the gauntlet areas are lined with cotton duck. The palms and the insides of the fingers and thumbs are reinforced with leather strips stapled one-quarter inch apart.

**Men's and Women's Heavy Duty Gloves** are Gunn-cut cowhide or horsehide gloves and are intended for heavy work. The gloves have continuous thumbs with leather welts inserted in the thumb seams. The seams at the base of the fingers also include a reinforcing leather welt, which is upturned to cover the stitching. An additional layer of leather reinforces the palms. The gloves have an adjustable strap and buckle on the back.

**Light Duty Work Gloves/Utility Gloves** are multifunctional but best suited for light work. The March 2008 redesign improved Soldier dexterity, tactility, and comfort by reducing the number of seams in the fingers, and the newer three-dimensional shape gives the gloves less bulk.

**Fuel Handlers' Gloves (FHG)** protect against kerosene-based fuels. The gloves are made of Nomex knit with leather palms, and are liquid-proof and flame-resistant, providing fuel handlers with maximized protection, performance, and comfort. The gloves have full Gore-Tex® direct grip glove inserts for waterproofing.

The **Protective Ensemble** includes riot control gloves, cut protective gloves, and forearm guards. The glove ensemble provides enhanced cut and puncture protection, and is an excellent resource for Military Police during riot control and pat-down scenarios.



Barbed Wire Handler's Gloves



Light Duty Work Gloves/Utility Gloves

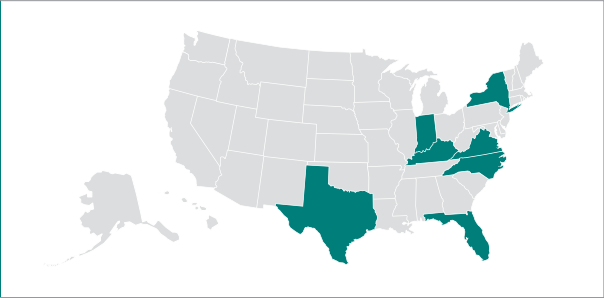


Men's and Women's Heavy Duty Gloves



Fuel Handler's Gloves (FHG)

*Improves Soldier comfort with climate-appropriate utility uniforms and accessories that function as combat clothing or duty uniforms.*



The **Improved Boot Sock** is over-the-calf style, with a double welt top and a double-covered elastic yarn that is continuous from the welt top to the ankle area. The fully reciprocal heel, toe, and foot area is padded with a half-cushion terry for blister protection. The entire ankle, heel, toe, and foot is knit 360 degrees with a main body yarn (terry yarn) and a silver-coated nylon yarn knit in the same position. The nylon yarn is permanently coated with 99.9 percent pure silver, is non-allergenic and antimicrobial, and provides protection against bacteria and fungi.

The **Insect Net** and **Insect Hat** are worn in tropical and semitropical areas when helmets are not worn. The hat has a soft crown and stitched brim, chin strap, and camouflage band. The net attaches to the hat by an elastic cord with two loops at the bottom to fasten buttons.

The **Fleece Cap** is foliage green, synthetic microfleece, and is 100 percent polyester; its bell-shape and pull-on style provides increased comfort and durability.

The **Hat, Sun Hot Weather (Boonie Hat)** has a soft crown, a standard-width quilted stitched brim, a chinstrap, and a camouflage band. The cloth is ripstop poplin, 50/50 percent cotton/nylon, and is Type III water-repellent. The hat comes in the universal camouflage pattern.

The **Rigger Belt** is a desert sand belt made of nylon rigger webbing and a parachute buckle. The belt offers increased comfort, durability, and functionality.

The **Sock Liner, Dress Sock** is a dual-purpose item worn by the male and female Soldier under all types of boot socks to prevent blisters. It can also be worn as a dress sock with black dress shoes. The socks are made of cotton yarn plied with stretch nylon yarn.

The **Brown Bath Towel** is issued in Soldiers' Clothing Bags for use in garrison and field environments. The terry cloth fabric is 70 percent polyester and 30 percent cotton. The towel is 20 inches by 40 inches.



Fleece Cap



Insect Net Insect Hat



Hat, Sun Hot Weather (Boonie Hat)



Improved Boot Sock



Rigger Belt

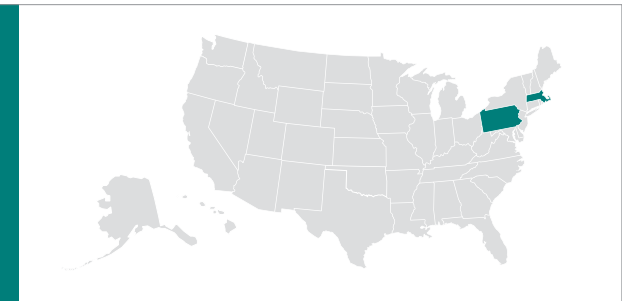


Brown Bath Towel

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# Modular Lightweight Load-Carrying Equipment (MOLLE)

*Enables the Soldier to tailor individual loads to meet mission needs with modular, flexible, load-carrying equipment.*



The **Modular Lightweight Load-Carrying Equipment (MOLLE)** system was developed to replace the All-Purpose Lightweight Individual Carrying Equipment (ALICE) and Integrated Individual Fighting System (IIFS).

The MOLLE consists of a modular rucksack with removable components, as well as a fighting load carrier with removable pockets for rifleman, pistol, squad automatic weapon, medic, and grenadier configurations. For short-duration missions, Soldiers can opt to use the assault pack and waist pack. The modularity allows Soldiers to tailor the load to meet mission needs.

The **Tactical Thigh Holster (TTH)** system is designed to attach to the mounted or dismounted Soldier's Army Combat Uniform trouser belt, enabling the Soldier to lower the holster to arm's length while standing or place the holster in a ready access position while seated. The TTH is compatible with the Soldier Enhancement Program initiative M9/M11 Pistol Mount Interface with or without the Integrated Laser/White Light Pointer (ILWLP).



## Modular Lightweight Load- Carrying Equipment (MOLLE)

Clothing & Individual Equipment



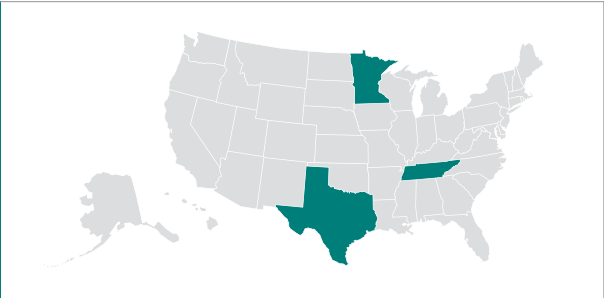
Modular Lightweight Load-Carrying Equipment (MOLLE)



Tactical Thigh Holster (TTH)

# Load Carriage-Related Equipment

*Enables Soldiers to carry mission-essential equipment with minimal effect on mobility and survivability.*



The **Entrenching Tool (E-Tool)**, a “D” handled shovel, has a collapsible feature that makes it easily transportable.

The **Mattock**, a supplement to the E-Tool, has a 24-inch wooden handle and a 12-inch steel head with mattock and axe blades. It can be used to cut tree roots and limbs, break rock, and loosen ground.

The **Equipment Belt Extender (EBE)**, a 4-inch equipment belt, has triple layers of 2.25-inch wide webbing with 2.25-inch side-release buckles sewn on each end.

The **Field Case** is designed to hold a first aid kit or compass. It attaches to an equipment belt or suspenders with a slide keeper.

The **Mounted Crewman Compartmented Equipment Bag (MCCEB)** is a compartmentalized bag designed to organize and carry the load of mounted crewman. The bag’s three compartments have zippered openings with secured flaps, and the bag’s shoulder straps allow for easy transport.

## Load Carriage-Related Equipment

Clothing & Individual Equipment



Field Case



Equipment Belt Extender (EBE)

Mattock

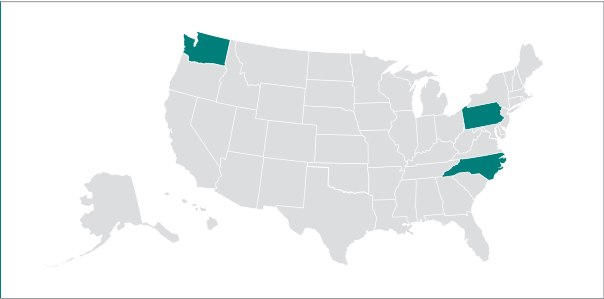


Entrenching Tool (E-Tool)



Mounted Crewman Compartmented Equipment Bag (MCCEB)

*Provides the Soldier with a portable means of hydration that interfaces with chemical-biological (CB) masks.*



The **One-Quart Canteen**, a rigid plastic container, interfaces with the drinking tube of the chemical-biological protective mask via the Nuclear, Biological and Chemical (NBC) Cap, allowing Soldiers to drink from the canteen without removing their masks. The cover has an outer pocket for water purification tablets and attaches to the Soldier's equipment belt or load-carrying equipment.

The **Two-Quart Collapsible Canteen**, a flexible plastic container, interfaces with the drinking tube of the chemical-biological protective mask via the NBC Cap, allowing Soldiers to drink without removing their masks. The canteen cover has an outer pocket for water purification tablets. The canteen can be carried over the shoulder using a strap or can be attached to the Soldier's equipment belt or load-carrying equipment. It collapses when drained for less bulk.

The **Cold Weather Canteen System**, a one-liter stainless steel canteen with insulated carrier, ensures sufficient Soldier hydration during operations in extremely cold environments (minus 40 degrees Fahrenheit). The system interfaces with the drinking tube of the chemical-biological protective mask using a cap adapter/mouthpiece of low thermal conductive material. The insulated carrier is designed to attach to the Soldier's equipment belt or load-carrying equipment.

The **Modular Lightweight Load-Carrying Equipment (MOLLE) Hydration System**, an ergonomically designed water bladder with carrier, can be worn individually or integrated with load-bearing equipment or web harness systems. The bladder includes a drink tube with bite valve, a positive shut-off, and an exterior fill port. The carrier is made of abrasion-resistant 1000D Cordura™ nylon, has a sternum strap for added stability, and has a handle for filling on the go.

## Individual Soldier Hydration

Clothing & Individual Equipment



Two-Quart Collapsible Canteen



One-Quart Canteen

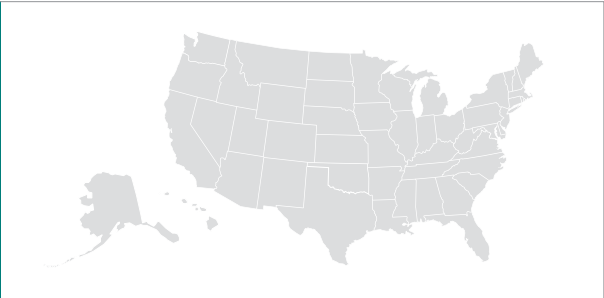


Cold Weather Canteen System



Modular Lightweight Load-Carrying Equipment (MOLLE) Hydration System

*Provides the Soldier with a complete illumination capability package that will replace the MX-991/U L shaped flashlight.*



The **Family of Flashlights (FoF)** consists of a Hands-Free Helmet-Mounted Light (HFHL) that is capable of being attached to the Modular Lightweight Load-Carrying Equipment (MOLLE) or the Interceptor Body Armor (IBA); a Handheld Tactical Light (HHTL), a Weapon Mountable Light/Illuminator (WML), and a Crew Served Weapons Light (CSWL). The focus of the FoF is to provide an increased illumination capability that is highly effective and more reliable than present lights or illuminators. The FoF will fill a current capability gap by providing lighter, more versatile, and more durable, multifunctional lights that feature increased range and better power management. The FoF will provide Soldiers with a complete illumination capability package that accommodates and supports a wide variety of roles.

The Soldier Enhancement Program (SEP) Executive Council recognized the need to improve the Soldier's illumination capabilities and approved the FoF as a SEP new start program in February 2005. The FoF will improve the Soldier's ability to illuminate the battlefield, complete tasks, and perform a myriad of duties. The FoF will also improve the Soldier's ability to read maps, perform first aid and maintenance duties, traverse/navigate over terrain, signal, conduct searches, control crowd access points during the conduct of escalation of force, and perform target identification and target engagement tasks. The variants of the FoF will considerably enhance the Soldiers' tactical advantage, survivability, and mobility.

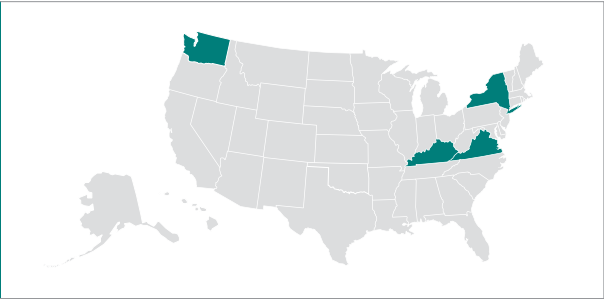


## Family of Flashlights (FoF)

Clothing & Individual Equipment



*Provides combat personnel with modular-concept sleep equipment, enhancing Soldier comfort in diverse environmental conditions.*



The **Modular Sleep System (MSS)** is a bag-within-a-bag concept. The MSS consists of a camouflaged, waterproof, breathable bivy cover, as well as lightweight patrol and intermediate cold weather sleeping bags. Compression sacks are included to store and carry the system. The MSS is available in colors compatible with the universal camouflage pattern. The patrol bag provides cold weather protection from 35 to 50 degrees Fahrenheit. The intermediate bag provides cold weather protection from minus 5 to 35 degrees Fahrenheit. Together, the patrol bag and intermediate bags provide extreme cold weather protection in temperatures as low as minus 30 degrees Fahrenheit. The bivy cover can be used in any configuration (warm, intermediate, or cold weather). Sleeping bags are made of ripstop nylon fabrics and continuous filament polyester insulation; camouflage bivy cover is made with waterproof, breathable, coated or laminated nylon fabric; the compression sacks are made with water-resistant, durable nylon fabric. In cold weather, the system is augmented with insulating garments from the Extended Cold Weather Clothing System.

The **Sleeping Mat** is a foliage green, closed-cell polyethylene foam pad. Two permanently attached straps secure the mat when in a rolled configuration. The mat is used as a ground insulator under the MSS to provide insulation from cold ground.

The **Self-Inflating Sleeping Mat** is used in the same manner as the sleeping mat, but has an open cell foam core sandwiched between, and laminated to, a foliage green, air impermeable, coated nylon fabric with a plastic valve in one corner. Once unrolled, the air valve is opened, allowing air to enter the mat as the foam expands.



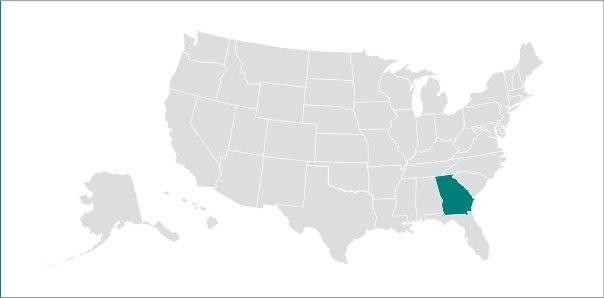
Self-Inflating Sleeping Mat



Sleeping Mat

# Improved Camouflage Face Paint

*Provides camouflage solutions for the Soldier in the visible and near-infrared regions of the electromagnetic spectrum as well as protection against thermal imagers and insects.*



**Camouflage Face Paint (CFP)** is used on all exposed skin to provide passive camouflage protection in the visible and near-infrared regions of the electromagnetic spectrum, as well as against thermal imagers, which operate in the mid- and far-infrared regions of the spectrum. The current camouflage compact is a cosmetic-like container with an acrylic mirror and compartments containing four colors. The improved camouflage container will consist of two sticks of two colors each; one with a DEET additive and one without.



## Improved Camouflage Face Paint

Clothing & Individual Equipment



*Offers the Soldier improved protection from flame and thermal threats, as well as counter-surveillance protection, increased multi-climate protection, and enhanced comfort.*

**The Ghillie Suit Accessory Kit (GSAK) Upgrade** provides surveillance units and snipers with various camouflage multi-functional materials to construct, repair, and modify Ghillie Suits to meet unique mission and climactic requirements. The upgrade kit consists of 18 items, including universal netting, over whites, FR jute, nylon cord, sewing kit, camo-pack, zip ties, DYE packs, seam grip, cordura, nylon webbing, fastex fasteners, gun sleeve, hook and loop and suspenders which are used to fabricate and maintain one Ghillie Suit. The GSAK upgrade affords the Soldier enhanced agility, multisystem operability, and anti-odor/anti-microbial properties.



**Ghillie Suit  
Accessory Kit  
(GSAK) Upgrade**  
Clothing & Individual Equipment



The **Suit, Contamination Avoidance, Liquid Protective (SCALP)** is an impermeable, lightweight, inexpensive disposable ensemble that provides supplemental protection when worn over standard chemical protective garments. SCALP consists of a jacket, trousers, and two footwear covers worn over the chemical protective overgarment and overboots. All components provide protection from liquid contamination for up to one hour.

The **Joint Protective Aircrew Ensemble (JPACE)** provides CB protection for Aircrew. The JPACE is a one-piece coverall and is intended to provide flame resistance. The JPACE provides the Soldier with 16 hours of chemical protection in a contaminated environment after 30 days of wear. The JPACE integrates and is compatible with legacy and new CB clothing items and chemical masks.

**Chemical  
Protective Clothing**  
Clothing & Individual Equipment

U.S. Army Firefighter's Integrated Suit-Combat (FIS-C)



Joint Service Lightweight Integrated Suit Technology (JSLIST)

Suit, Contamination  
Avoidance, Liquid  
Protective (SCALP)



Chemical  
Protective  
Undergarment  
(CPU)



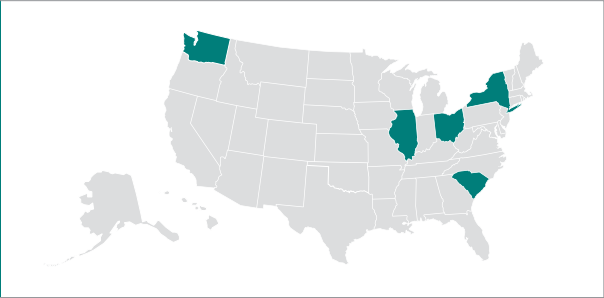
JC3



JPACE

# Chemical Protective Clothing—Accessories

*Protects the Soldier from chemical and biological (CB) contamination during battle and other mission operations.*



The **Chemical and Biological (CB) Protective Equipment Bag** is designed to consolidate and transport the CB protective gear. It is made of an abrasion-resistant nylon and incorporates a roll down quick-release buckle closure system. Modular Lightweight Load-Carrying Equipment (MOLLE) style web loops have been stitched to the carrier to accept cargo tie-down straps and for attachment to the current and developmental load carrying equipment.

The **Chemical Protective Helmet Cover** is a one-piece configuration made of butyl rubber-coated nylon cloth and gathered at the opening by elastic webbing enclosed in the hem. It provides any standard helmet with protection from CB contamination.

The **Chemical Protective Glove Set** includes the impermeable butyl rubber gloves with cotton knit liners, which protect the hands in a chemical-threat environment. The gloves are manufactured in right and left hand, five-fingered configurations, and shaped to follow the natural curvature of the hand in a relaxed position, while the inner permeable cotton five-finger gloves fit either hand.

The **Green Vinyl Overboot/Black Vinyl Overboots (GVO/BVO)** are made of an impermeable molded vinyl plastisol and have a slip-resistant outsole design. Elastic loops are pulled over three metal fasteners to close the gusset expansion after donning. The GVO/BVO are worn over standard combat boots to provide chemical protection when needed and moisture protection during wet weather. The GVO/BVO provides 24 hours of protection against all known CB agents after a maximum wear of 60 days.

The **Alternative Footwear System (AFS)** is made from an impermeable molded butyl rubber improved traction and durability over the GVO/BVO. Fastening and usage are identical to the BVO. The AFS provides 24 hours of protection against all known CB agents after a maximum wear of 45 days.

The **Joint Block 2 Glove Upgrade (JB2GU) Non-Fire Resistant (nFR)**, upgraded gloves, are made of an impermeable molded butyl rubber that provides increased tactility and dexterity over the current 25-mil butyl rubber gloves. The JB2GU nFR provides 24 hours of protection after 30 days of wear.



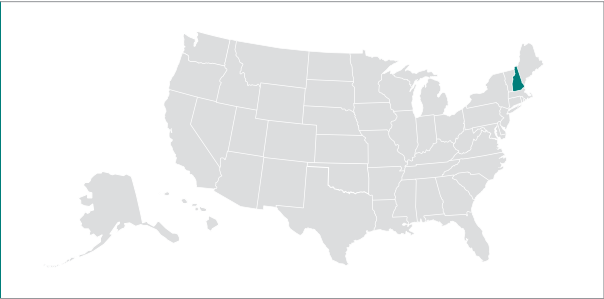
Chemical and Biological Protective Equipment Bag



Green Vinyl Overboot/Black Vinyl Overboots (GVO/BVO)



*Protects the Soldier working in highly toxic, oxygen-deficient, or unknown environments that are immediately dangerous to life and health.*



The **Improved Toxicological Agent Protective (ITAP) Suit** is a National Fire Protection Agency (NFPA) 1992 and 1994 Class-2 certified ensemble that will provide protection during peacetime and wartime short-term operations. ITAP will be deployed in “immediately dangerous to life and health” (IDLH) toxic chemical environments (up to 1 hour), for emergency lifesaving response, incident response, and routine chemical activity operations.

The **Self-Contained Toxic Environment Protective Outfit (STEPO)** is a NFPA 1991 and 1994 certified, totally encapsulating system that provides protection for personnel working in highly toxic, oxygen-deficient, or unknown environments that are IDLH. STEPO will replace the M3 Toxicological Agents Protective (TAP) ensemble for use in highly toxic areas (OSHA Level-A environments), while the ITAP ensemble is used for routine chemical activity operations in non-IDLH environments. STEPO provides 4 hours of percutaneous protection against chemical-biological agents, toxic industrial chemicals, unknown chemicals, rocket fuels, petroleum, oil, and lubricants.

STEPO and ITAP are both composed of five layers of Nomex and Teflon. The ITAP has an integral hood that is composed of three layers of Nomex and Teflon. STEPO and ITAP provide respiratory protection and cooling to the user, and both are compatible with the personnel radios.

## Toxicological Ensembles

Clothing & Individual Equipment



Improved Toxicological Agent Protective (ITAP) Suit

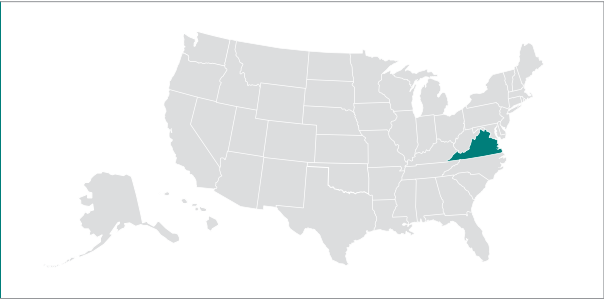


Self-Contained Toxic Environment Protective Outfit (STEPO)

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# Modern Army Combatives Kit (MACK)

*Allows Soldiers to experience the physical and emotional demands of hand-to-hand fighting prior to engaging in combat.*



The **Modern Army Combatives Kit (MACK)** enables units to conduct level 3 & 4 training in accordance with the Modern Army Combatives Program. Because it can be used to conduct safe, realistic, combative training for the individual mission, the MACK enhances Soldier performance and confidence going into battle.

Component materials for the MACK are foam, plastic, Plexiglas, leather, and polyester. It is black and comes in sizes small, medium, large, and extra large.



**Modern Army  
Combatives Kit  
(MACK)**

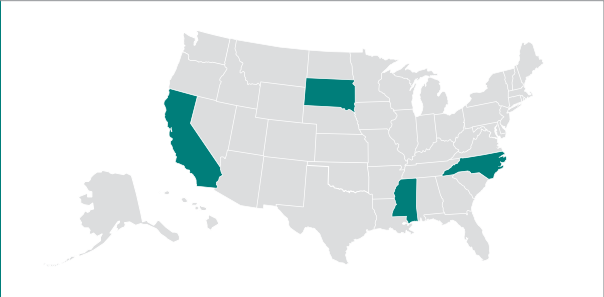
Clothing & Individual Equipment

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# Maneuverable Canopy (MC) Personnel Parachute System

*Enables the parachuting Soldier to steer toward a specific impact point in the drop zone.*



The **MC-6 Maneuverable Canopy Personnel Parachute System** offers the Airborne Soldier a new tactical, static line-deployed, steerable personnel parachute system, replacing the legacy MC-1 series parachute assembly, associated harness, and reserve. The MC-6 has a safer rate of descent, lower opening shock, reduced canopy damage, better turn ratio, and a better glide ratio than the MC1-1C. The system was designed specifically to operate at higher altitudes above mean sea level with heavier weights. These improvements result in better maneuverability, greater canopy control, and reduced jumper injury. This program is a combined U.S. Army and Special Operations Command (SOCOM) project.

The MC-6 can be used throughout the full spectrum of operational and environmental conditions. The MC-6 integrates the maneuverable main canopy (SF-10A) with the T-11 harness and T-11 reserve parachute (T-11R).

The MC-6 main and reserve canopies are made of 1.1 oz. low-porosity ripstop nylon. Block construction facilitates manufacturing and repair. The container bag is made of Cordura®, an abrasion and water-resistant fabric. The harness is made of Type 7 webbing.

The main canopy assembly weight with T-11 harness is 26 pounds. The T-11R reserve assembly weight is 15 pounds. Main canopy is 32 feet in diameter; the reserve canopy is 24 feet in diameter.

The **MC1-1C** is utilized by small teams during Airborne operations and training. The parachute has a parabolic shape with an H-TC shape configuration in the rear with 60 square feet of canopy removed. It has a nominal diameter of 35 feet and weighs 28 pounds.



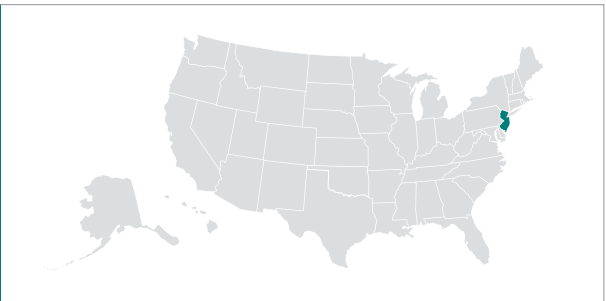
## Maneuverable Canopy (MC) Personnel Parachute System

Clothing & Individual Equipment



# Non-Maneuverable Canopy (T-11) Personnel Parachute System

*Provides the Soldier with a parachute that is capable of handling heavier jump weights and has a more stable, slower rate of descent.*



The **Non-Maneuverable Canopy (T-11) Personnel Parachute System** is the next-generation personnel parachute system. The T-11 will provide the Airborne Soldier with the first wholesale modernization of the tactical parachute system since the 1950s. The T-11 includes a completely redesigned main and reserve parachute and an integrated harness assembly that is suitable for the 5th percentile to the 95th percentile Soldier.

The main canopy is a modified version of a cross/cruciform platform. The canopy has an increased inflated diameter of 14 percent and a 28 percent increase in surface area, when compared with the T-10D assembly. The reserve canopy is a proven derivative of the British Low Level Parachute (LLP) aero-conical design that includes apex scoop pockets at the top of the reserve canopy and skirt assist lines at the system’s hem to promote fast opening of the reserve system during low-speed malfunctions. Unlike the current reserve parachute system, the T-11R reserve uses an omni-directional, center-pull deployment system. The T-11 harness is designed to displace opening shock forces of the reserve parachute equally along the long axis of the jumper’s body. Additionally, the T-11 main canopy utilizes a unique deployment sequence to reduce the opening shock and canopy oscillation. The T-11 is designed to have an average rate of descent of 19 feet per second for the 95th percentile Soldier, compared with 24 feet per second with the T-10D. This reduction will result in significantly lower landing injury rates for jumpers.

**Weight:** System, 53 pounds; main parachute with T-11 harness, 38 pounds; T-11 reserve assembly, 15 pounds.  
**Size:** Main canopy is 30.6 feet inflated diameters at the hem; reserve canopy is 24 feet nominal diameter.

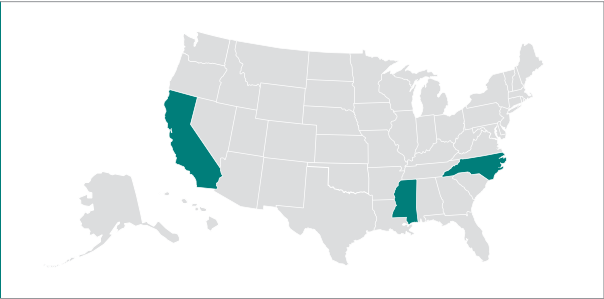


## Non-Maneuverable Canopy (T-11) Personnel Parachute System

Clothing & Individual Equipment



*Enables the safe delivery of the parachutist, weapon systems, and equipment to the drop zone in winds up to 13 knots.*



The static line-deployed **T-10D Parachute** is used for combat mass assault Airborne operations and training. Depending upon air density and the jumper's total weight, the parachute's average rate of descent is from 22 to 24 feet per second; total suspended weight limitation is 360 pounds. The parachute is deployed using either a 15- or 20-foot static line, allowing the parachutist to be delivered by either C-130 or C-17 U.S. Air Force aircraft. The T-10D main parachute is a parabolic shape and has a nominal diameter of 35 feet, 30 suspension lines, and a mesh anti-inversion net.

The T-10D Parachute assembly consists of five components: pack tray, troop harness, deployment bag, riser, and canopy. The parachute has a combined service life of 16.5 years; service life is 12 years and shelf life is 4.5 years. The T-10D Parachute must be repacked every 120 days. The T-10D Parachute is made of nylon materials commonly used in the manufacturing of parachutes.

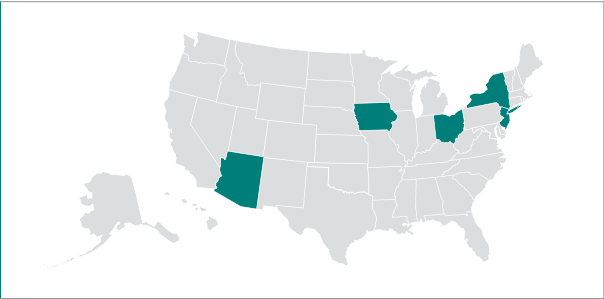
The **Modified Improved Reserve Parachute System (MIRPS)** includes a standard T-10 reserve parachute canopy assembly, integrated with a commercial deployment assistance device composed of a bridle line, pilot parachute, and spring. The pack tray includes a line bag for stowing suspension lines and an inner staging flap that holds the reserve parachute until sufficient tension is achieved through the bridle/pilot parachute assembly during deployment. The MIRPS pack tray is slightly larger than that of the T-10 reserve pack tray so it accommodates a larger pilot chute, spring, and bridle. The pack tray has a yellow stripe along the rip cord protector flap and is made of nylon textile materials commonly used to make parachute systems.



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# Military Free Fall (MFF) Parachute System

*Maximizes the success of Army free fall missions by enabling clandestine insertion.*



The **Military Free Fall (MFF) Advanced Ram Air Parachute System (ARAPS)** provides a multi-mission, high-altitude parachute delivery system that allows personnel to exit at altitudes between 3,500 feet and 35,000 feet. The parachute, which replaces the current MC-4 parachute, supports a total jumper weight of 450 pounds. It also provides non-MFF personnel with a ram air parachute that is static-line deployed.

The ARAPS' three accessory systems are at different stages of the acquisition process:

- The **Electronic Automatic Activation Device (EAAD)** is used with current and next-generation parachute systems, replacing the Automatic Ripcord Release (AR2). EAAD provides a simpler and more reliable method of activation in the event the parachutist is unable to deploy the parachute at the appropriate altitude. The EAAD activates and cuts the reserve parachute closing loops if the jumper is falling at 78 mph or faster at the minimum deployment altitude.
- The **Navigation Aid (NAVAID)** will provide in-flight navigation and mission planning capability, allowing parachutists under canopy to locate themselves and the intended drop zone easily. The system utilizes a global position system that integrates with the Mission Planner of the Joint Precision Airdrop System (MP JPADS) ensuring more accurate canopy flight and drop zone landings.
- The **Parachutist Oxygen Mask (POM)** will provide supplemental oxygen at 13,000 feet and higher and will be easier to use and maintain than the current MBU-12P mask. The POM will not interfere with the parachutist's vision or range of motion.

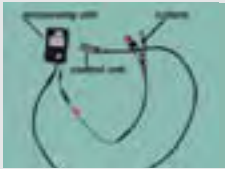
**Military Free Fall (MFF) Parachute System**  
Clothing & Individual Equipment



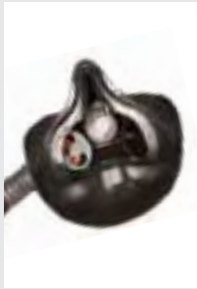
Military Freefall Navigation Aid (NAVAID)



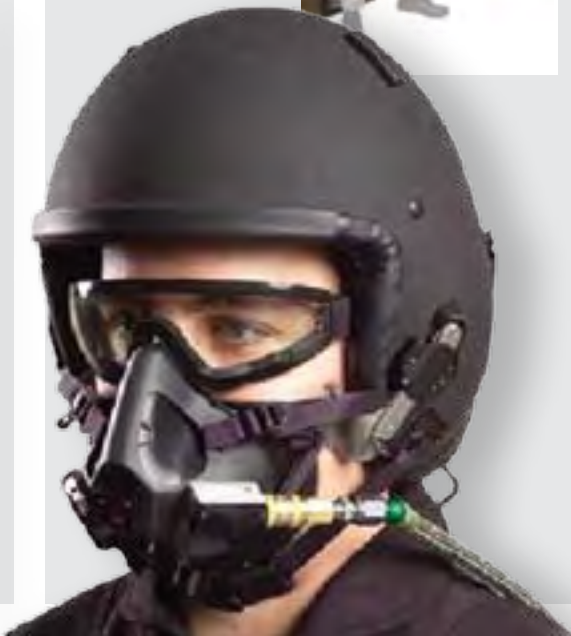
Military Freefall (MFF) Advanced Ram Air Parachute System (ARAPS)



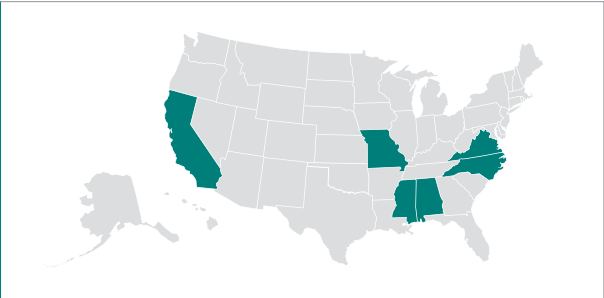
Electronic Automatic Activation Device (EAAD)



Parachutist Oxygen Mask (POM)



*Secures individual mission-essential equipment to the parachutist while in the aircraft, during exit, and during main parachute deployment and descent.*



The **Harness, Single-Point Release (HSPR)**, used to secure equipment to the parachutist, is made of nylon webbing with friction adapters, two adjustable leg straps, two D-ring attaching straps, and a lowering line. The harness is secured around the equipment load and allows for a simultaneous release of the load and leg straps from the parachutist and parachute harness.

The **Parachutist Drop Bag (PDB)**, a commercial, load-carriage drop bag with a single point release, is used with a 7-foot lowering line when conducting Military Free Fall, or a 15-foot lowering line when conducting static line parachuting operations. It has exterior pockets for easy access to maps and water, and can be worn front- or rear-mounted. The retention strap is made of nylon webbing, has an attachment eyelet in the center, and has hook and pile tape on each end.

The **Universal Static Line (USL)** is composed of a 15-foot static line, a 5-foot extension, and a snap hook. During C-17 operations, the extension is added to the 15-foot static line, thereby meeting the requirement for the 20-foot length. The static line is made of textured tube-edge 6.6 nylon and is coated to be water repellant.

The **M-1950 Weapons Case**, a padded case, is made of cotton duck or nylon, and is designed to carry individual or crew served weapons. It protects both the jumper and the weapon from injury/damage during Airborne operations. The M-1950 Weapons Case must be rigged with a lowering line when the case and weapons weight is more than 35 pounds.



**Parachutist Equipment**  
Clothing & Individual Equipment



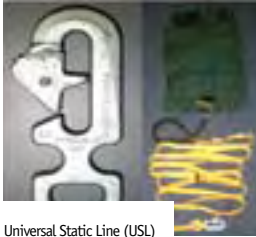
Parachutist Drop Bag (PDB)



Harness Single Point Release (HSPR)




M-1950 Weapons Case



Universal Static Line (USL)

**Product Manager Soldier Survivability (PM SSV)** develops and fields high-tech equipment to provide enhanced force protection. PM SSV produces state-of-the-art armor protection to defeat ballistic, fragmentation, blast, and flame threats in the theater of war. Its products include body armor, helmets, and ballistic eye protection.

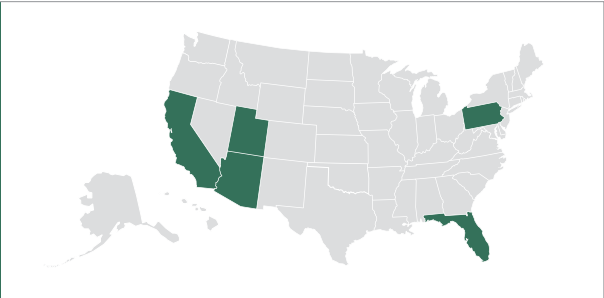




**“Being a truck driver, you know, I’m on the road hours, to days, to weeks on end... And the ACH was great, lightweight, comfortable... The old Kevlar systems were not as good.”**

—SSG Jeremy Gilmore, E Company, 3rd Battalion,  
25th Aviation Regiment

*Increases Soldier survivability by stopping or slowing bullets and fragments and reducing the number and severity of wounds.*



**Interceptor Body Armor (IBA)**, the most up-to-date body armor available, is a modular system that consists of a soft armor vest, ballistic plates, and attachments that increase the area of coverage.

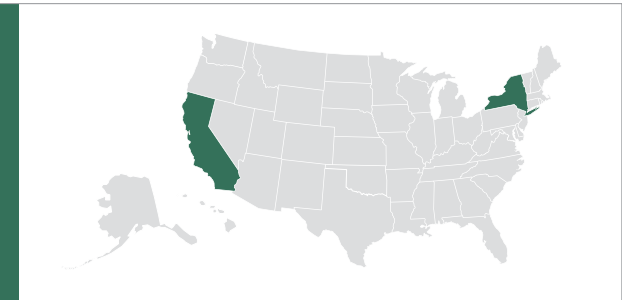
The **Outer Tactical Vest (OTV)** and **Improved Outer Tactical Vest (IOTV)** protect against fragments and 9mm rounds. The **Enhanced Small Arms Protective Inserts (ESAPI)** plates and the **Enhanced Side Ballistic Inserts (ESBI)** add protection and can withstand multiple small arms hits, including armor-piercing rounds.

The OTV is compatible with the **Deltoid and Axillary Protectors (DAP)**, which provide additional fragmentation and 9mm protection to the upper arm and underarm areas, and with the **Groin Protector** and **Throat Protector**. The IOTV has throat protection and underarm protection built in, and is compatible with the Deltoid and Groin Protectors. The side-opening IOTV also increases area of coverage over the front-opening OTV. The IOTV comes in 11 sizes, including three tall sizes, whereas the OTV comes in eight sizes. The IOTV is three pounds lighter than the OTV, and features a quick-release handle for quick removal during emergencies. It includes multiple adjustment points to improve fit, weight distribution, and load-carriage capabilities. The IOTV has a mesh lining for better ventilation. With all inserts and plates, the total system weight for IBA with the IOTV, size medium, is 30 pounds, compared with 33.11 pounds for IBA with the OTV.

**Body Armor,  
Interceptor**  
Soldier Survivability



*Protects Explosive Ordnance Disposal personnel from the effects of exploding ordnance and improvised explosive devices.*



The **Advanced Bomb Suit (ABS)** is a full body ensemble that protects the Explosive Ordnance Disposal (EOD) Soldier from threats associated with IEDs, including those related to fragmentation, blast overpressure, impact, heat, and flame. The ABS leverages new material technology and design to improve protection, comfort, and ergonomics.

To minimize weight and maximize flexibility, fragmentation protection is provided at various levels, specific to body regions, based on susceptibility to wounds. Blast overpressure protection is provided to the front of the thorax. Impact protection is provided to the head and spine. Heat and flame protection are provided by materials designed to offset those types of threats. A hand protection module and face shield upgrade module extend protection to those areas. All ballistic inserts are removable to facilitate laundering and repair. The ABS includes an ice-based cooling system to extend mission duration. The system can be doffed in less than 30 seconds. The system is equipped with provisions that allow future communications, performance, and capability upgrades.



## Advanced Bomb Suit (ABS)

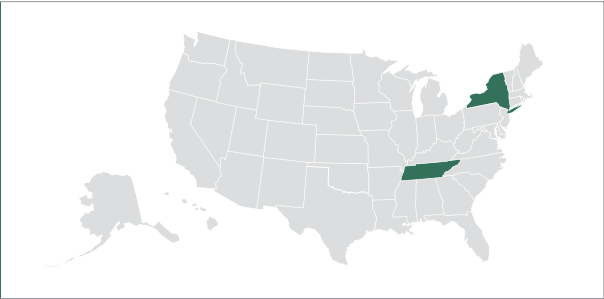
Soldier Survivability

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# Body Armor Set, Individual Countermine (BASIC)

*Provides dismounted Soldiers with improved ballistic protection from anti-personnel mines.*



The **Body Armor Set, Individual Countermine (BASIC)** is an armored clothing system designed to be worn by dismounted Soldiers during mine-clearing exercises. In addition to the Advanced Combat Helmet (ACH) and Interceptor Body Armor (IBA). BASIC includes ballistic protective trousers, overboots to protect against fragmentation, the **Blast Protective Footwear System (BPFS)**, and fragmentation-resistant face shield. The BPFS is standoff device that may supplement or replace the overboot and provides more than six times the protection for feet and lower legs. The BPFS does not significantly impair Soldier mobility during mine-sweeping and probing operations, nor does it interfere with the Soldier's operation of hand-held mine detectors.



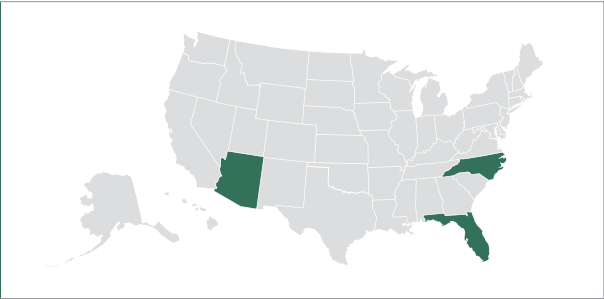
## Body Armor Set, Individual Countermine (BASIC)

Soldier Survivability



*Provides the Soldier with 9mm handgun ballistic protection.*

**Concealable Body Armor (CBA)**, intended for the Military Police (MP) and Criminal Investigators (CID), offers maximum concealable torso coverage for 9mm, full metal jacket 124-grain bullet protection. With its minimal weight, the CBA is comfortable for extended periods.



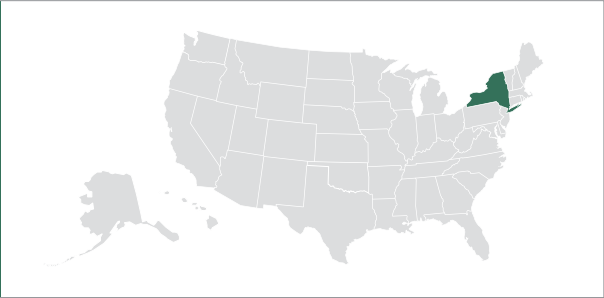
## Body Armor, Concealable

Soldier Survivability



# Body Armor, Cupola Protective Ensemble (CPE)

*Protects Soldiers manning crew-served, weapon-ring mount cupolas on military vehicles from blast and fragmentation effects of rocket propelled grenades (RPGs) and improvised explosive devices (IEDs).*



The **Cupola Protective Ensemble (CPE)** is a modified countermine ensemble with a blast and fragmentation protective visor, trousers, jacket, front and rear blast plates, and an upper torso cooling system. The CPE is worn over the standard Interceptor Body Armor (IBA), extending protection to the head, neck, face, and extremities. The integrated cooling system offsets heat effects. A contoured Kevlar neck guard provides protection for neck and temporal lobes. The CPE consists of the following:

- Base jacket
- Sleeves with rigid composite inserts (forearm and bicep)
- Blast plate assembly—chest and groin
- Rear blast plate
- Pants and integrated groin protector
- Removable explosive ordnance disposal collar
- Optional neck/nape guard
- Visor System worn with Advanced Combat Helmet
- Hand guards



## Body Armor, Cupola Protective Ensemble (CPE)

Soldier Survivability



# Body Armor, Improved Cupola Protective Ensemble (iCPE)

*Protects Soldiers manning weapon-ring mount cupolas on military vehicles from blast and fragmentation effects of rocket propelled grenades (RPGs) and improvised explosive devices (IEDs).*

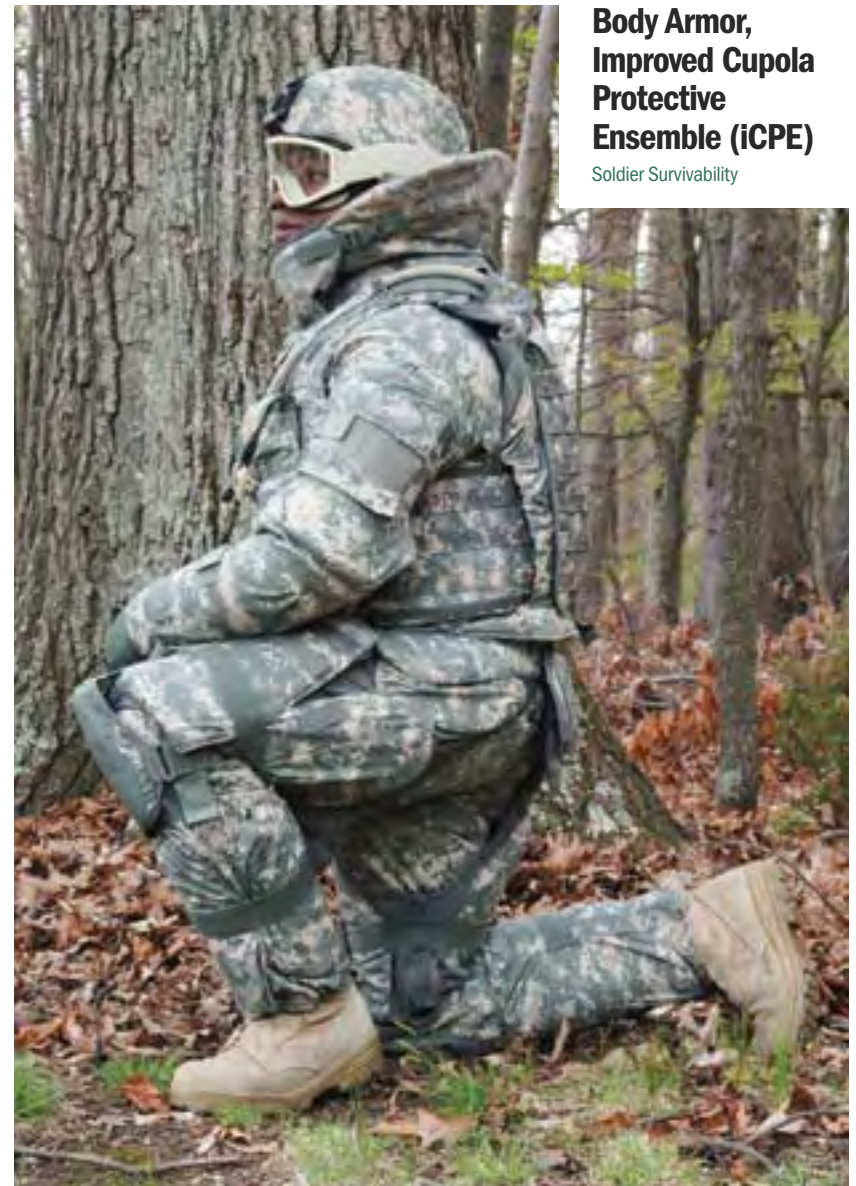


The **Improved Cupola Protective Ensemble (iCPE)** is designed to be worn under the Improved Outer Tactical Vest (IOTV) to provide protection to the head, neck, face, and extremities. iCPE includes a ballistic face shield to mitigate IED blast and fragmentation effects as well as RPG fragmentation effects. The iCPE includes an integrated vehicle-powered cooling system to combat heat effects during convoy escort operations.



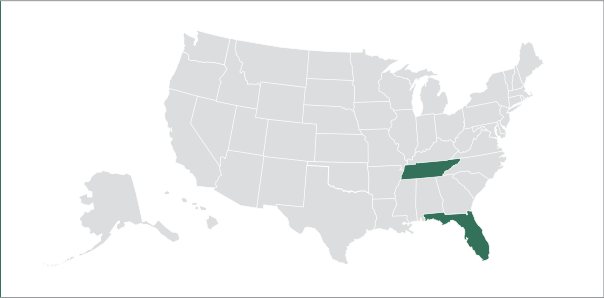
## Body Armor, Improved Cupola Protective Ensemble (iCPE)

Soldier Survivability



# Stab Protective Body Armor, Concealable

*Protects the Soldier from ice picks and other sharpened metal objects used as weapons.*



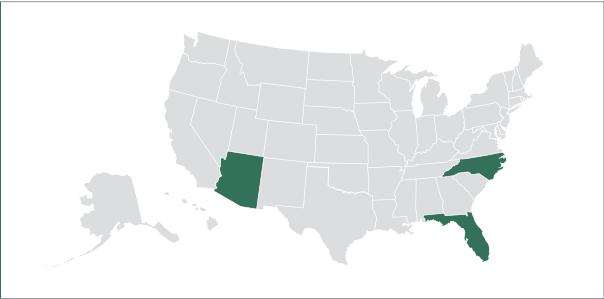
The **Concealable, Stab-Protection Body Armor (CSPBA)** is worn by Soldiers performing law enforcement operations, including confinement of enemy prisoners of war and overseeing civilian internees, for protection from homemade weapons and handguns. CSPBA provides soft armor protection to the torso against a 9mm, full metal jacket 124-grain bullet and meets the California Ice Pick standard for protection against other crude stab/slash weapons.



**Stab Protective  
Body Armor,  
Concealable**  
Soldier Survivability



*Provides the Soldier with concealable protection for extended period of wear.*



The Army's **Soldier Protection Demo IV (SPD IV)** seeks to enhance the effectiveness of the current **Concealable Body Armor (CBA)**, which is designed to provide the Soldier with concealable, minimum weight, ballistic protection that is comfortable to wear over extended periods of time. **Concealable, Stab-Protection Body Armor (CSPBA)** is intended to be worn by Soldiers in correction, confinement, EPW, and law enforcement operations to protect from homemade weapons and handguns. CBA offers the Soldier maximum concealable torso coverage for 9mm, full metal jacket 124 grain bullet protection.

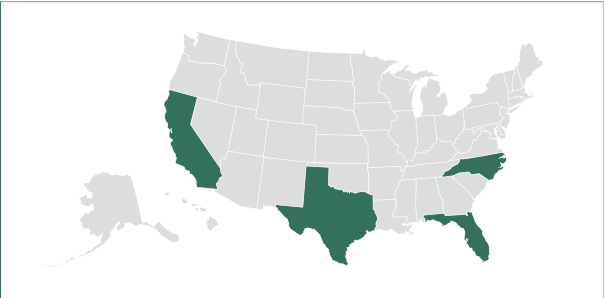
## Soldier Protection Demo IV

Soldier Survivability

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*Offers Soldiers enhanced protection on the modern battlefield.*



The Army’s **Soldier Protection Demo V (SPD V)** is evaluating a replacement for the current **Combat Vehicle Crewman (CVC) Body Armor** with a modular system designed to accommodate the Soldier on today’s battlefield. The goal for the design is a system that features tailorable protective coverage levels that can be repositioned on the body by the Soldier to accommodate form, fit, and function depending on duty position and platform.

The new system will be designed to provide protection to the abdomen/torso, deltoid, upper shoulder and arm while not interfering with platform controls during ingress/egress or while performing crew drills. It must provide the same ballistic levels as current Interceptor Body Armor systems, be flash and flame retardant to the same level as the current spall vest, and be compatible with all CVC Organization Clothing and Individual Equipment (OCIE). It will be compatible with the current hard armor ballistic inserts, ESAPI and/or XSAPI.

The system will have a quick-release feature and provide the capability to extract an unconscious Soldier from the platform. It will be designed to reduce or eliminate snag hazards currently encountered with fielded systems.

The new system will accommodate Soldiers in sizes ranging from the 5th through the 95th percentile.



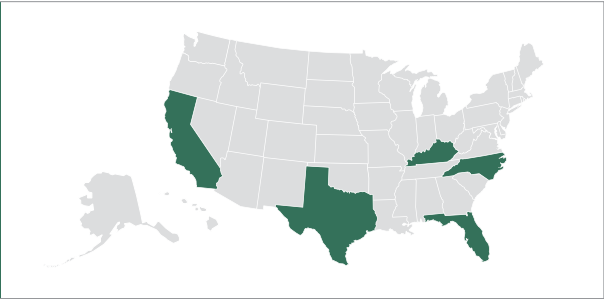
## Soldier Protection Demo V

Soldier Survivability

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*Provides the Soldier enhanced lower extremity protection.*



**Soldier Protection Demo VI (SPD VI)** is an initiative of combat and materiel developers to refine requirements and to identify potential solutions for lower extremity cover and protection for the Soldier. SPD VI will be a demonstration of six candidate systems of lower extremity body armor to recommend best technical approaches, identify best solutions and current capabilities of lower extremity protection.

SPD VI will provide the same level of protection as current IBA and will be modular enough to allow dismounted Soldiers to maneuver short distances greater than 100 meters. It will offer full range of motion for a mounted Soldier and will not affect the Soldier's ability to ingress or egress vehicles. Another advantage is that it can be quickly donned and doffed.



## Soldier Protection Demo VI

Soldier Survivability

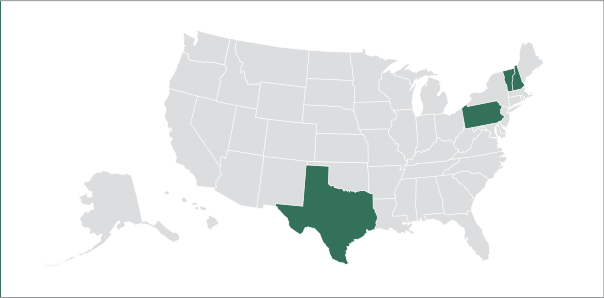
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# Advanced Combat Helmet (ACH)

*Enhances ballistic protection, stability, and comfort without degrading the Soldier's field of vision and hearing.*

The **Advanced Combat Helmet (ACH)** shell is available in five sizes. The modular pads of the suspension system provide blunt force protection and physical comfort. The edge of the ACH shell is finished with a rubber trim. The cotton/polyester chin strap, a four-point design, allows for quick adjustment and includes a neck pad that provides fragmentation protection. The helmet shell is Aramid fabric in foliage green 504. It weighs between 3 and 3.8 pounds, depending upon size. The helmet cover is available in the universal camouflage pattern.

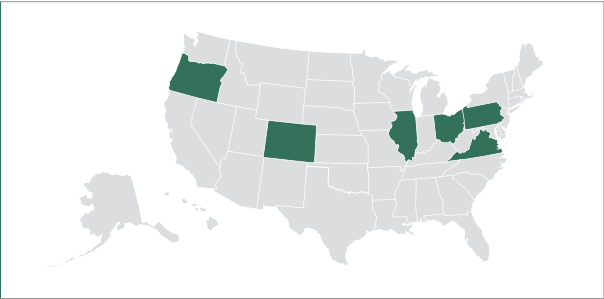




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# Advanced Combat Helmet Pads

*Provides the Soldier with impact protection, significantly reducing head trauma.*



The **Advanced Combat Helmet (ACH)** uses a series of modular, lightweight, and moisture-resistant **pads** that act as the suspension system between the wearer’s head and the helmet shell. The pads are easily attached, removed, and reattached to the inside helmet shell via hook tape disks permanently attached to the inside of the helmet shell. When properly inserted into the ACH, the pad suspension system provides non-ballistic impact force protection level of 150g against impacts of 10 feet per second, thereby significantly reducing the severity of head trauma to Soldiers.





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# Combat Vehicle Crewman Helmet (CVCH)

*Provides ballistic protection to the Soldier's head, temples, ears, and neck from fragmenting munitions without degrading vision, stability, and hearing.*



The **Combat Vehicle Crewman Helmet (CVCH)** consists of a rigid, compression-molded, outer shell constructed of Aramid Kevlar fabric coated with phenolic and polyvinyl butyral resins. The shell has rubber-edging adhesive along its peripheral contour.

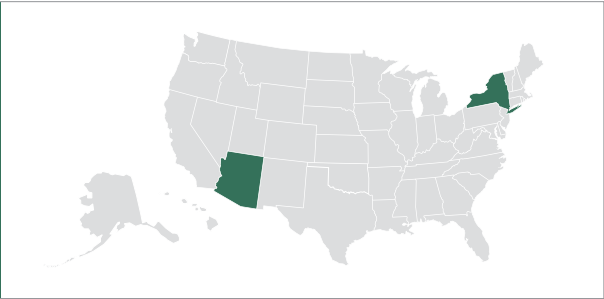
The liner is constructed with energy-absorbing foam sections enclosed in a flame-resistant Nomex mesh fabric. The CVCH is attached to a fabric mesh inner liner by snap fasteners and hook-and-pile tape. Located on the front of the helmet are leather fastener mounts for attaching the shell to the chin strap.

## Combat Vehicle Crewman Helmet (CVCH)

Soldier Survivability



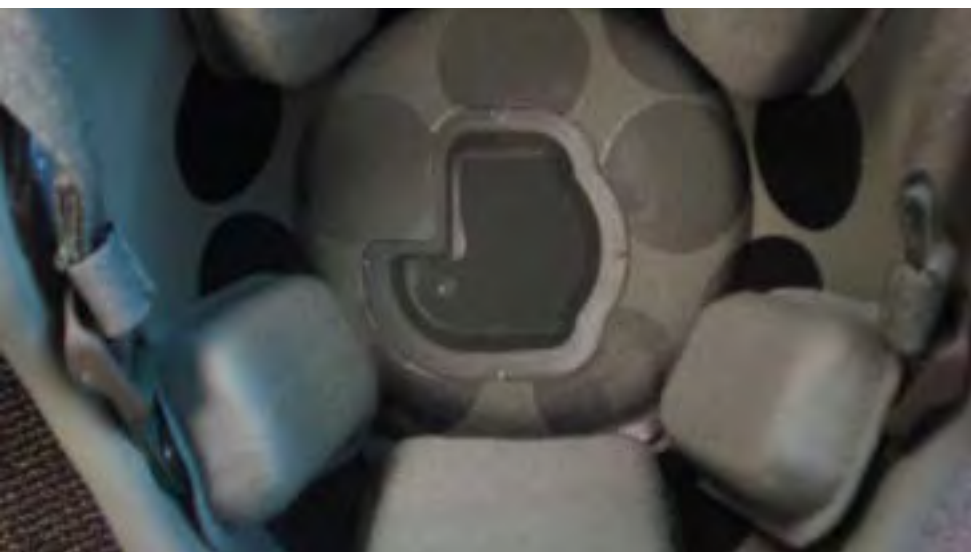
*Detects and provides analysis of explosions and other impact events that lead to head trauma.*



The **Helmet Sensor (HS)** is a small, lightweight, low-power sensor suite that mounts to the Advanced Combat Helmet or the Combat Vehicle Crewman Helmet. It detects, measures, and records impact and blast overpressure associated with improvised explosive devices (IED) and other events that may cause concussions in an operational environment. The Army is using two versions of the Helmet Sensor, one that mounts externally to the rear of a helmet and one that mounts internally under the padding in the crown of the helmet. Both sensors continuously and automatically collect data, recording acceleration and peak overpressure from IED blasts, crashes, blunt impact, and ballistic events, while discriminating such events from insignificant events such as dropping a helmet.

	External Mount Helmet Sensor	Internal Mount Helmet Sensor
Weight	6.24 ounces	1.23 ounces
Battery Life	6–8 months	6 months without recharging
Acceleration Capture Range	1 g to ≥4,000 g	1 g to ≥5,000 g
Number of recordable events	More than 500, with indefinite storage	More than 600, with indefinite storage
Download method	By USB port to any computer	By micro USB*

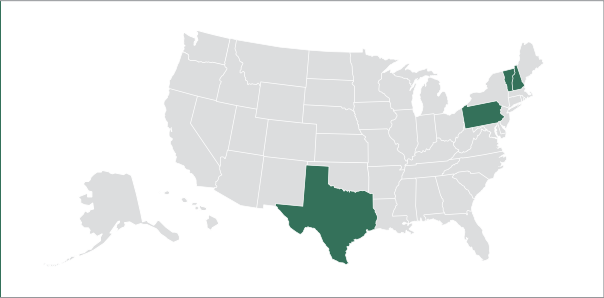
*\*Data from multiple sensors can be downloaded at once.*



# Advanced Combat Helmet (ACH) 7.62

*Enhances ballistic protection, stability, and comfort without degrading the Soldier's field of vision and hearing.*

The **Advanced Combat Helmet (ACH) 7.62** provides protection against 7.62mm threat rounds. The ACH 7.62 uses advanced thermoplastic materials that require different manufacturing processes than those associated with resin impregnated para aramids. The materials are ultrahigh molecular weight polyethylene.



## Advanced Combat Helmet (ACH) 7.62

Soldier Survivability



# Military Combat Eye Protection (MCEP) – Goggles

*Provides Soldiers with laser and ballistic eye protection to reduce risk of eye injuries.*



The **Military Combat Eye Protection (MCEP)** program enhances the Soldier's battlefield capabilities when wearing eye protection. MCEP provides laser protection (maintaining ballistic protection) and ultimately protects against more laser weapon systems operating in the optical region of the electromagnetic spectrum while providing sufficient light transmission, thus enabling the Soldier to wear the system both in daylight and at night during all missions, including airborne operations. It provides goggles for both prescription and nonprescription wearers.

The MCEP replaces standard eye protection products that are not compatible with modern battlefield requirements. To increase the overall use of protective eyewear, the MCEP program qualifies commercial eyewear products by testing to numerous ballistic, optical, and operational standards. Those items that quality are included in an Authorized Protective Eyewear List (APEL). Each product on the APEL has been qualified to the American National Standards Institute (ANSI) Z87.1 Standard for Occupational and Educational Personal Eye and Face Protection Devices and meets the ballistic fragmentation testing for goggles. Goggles currently listed include: **Arena Flakjak, ESS Land Ops, ESS Vehicle Ops, ESS Profile NVG, and Revision Desert Locust.**

For Soldiers who require corrective lenses, two goggles have approved prescription lens carriers. All items have assigned National Stock Numbers and may be purchased through normal supply channels. All optical inserts/carriers for those who wear glasses are available by orders placed at any optometry or ophthalmology clinic, including those in theater.



Arena Flakjak



ESS Land Ops



ESS Profile NVG



ESS Vehicle Ops



Revision Desert Locust

# Military Combat Eye Protection (MCEP) – Spectacles

*Provides laser and ballistic eye protection for Soldiers, reducing the likelihood of eye injuries.*



The **Military Combat Eye Protection (MCEP)** program enhances the Soldier's battlefield capabilities when wearing eye protection. MCEP provides laser protection (maintaining ballistic protection) and ultimately protects against more laser weapon systems operating in the optical region of the electromagnetic spectrum while providing sufficient light transmission to enable Soldiers to wear the system both in daylight and at night during all missions, including airborne operations. It provides spectacles for both prescription and nonprescription wearers.

The MCEP replaces standard eye protection products that are incompatible with modern battlefield requirements. To increase the overall use of protective eyewear, the MCEP program qualifies commercial eyewear products by testing to numerous ballistic, optical, and operational standards. Those items that pass the testing are included in an Authorized Protective Eyewear List (APEL). Each product on the APEL has been qualified to the American National Standards Institute (ANSI) Z87.1 Standard for Occupational and Educational Personal Eye and Face Protection Devices and meets the ballistic fragmentation testing for spectacles. Spectacles currently listed include: **ESS ICE 2, ESS ICE NARO, Oakley SI Ballistic M Frame, Revision Sawfly, Uvex XC, Uvex Genesis, Wiley-X SG-1, and Wiley-X PT-1SC.**

For Soldiers who require corrective lenses, five of the spectacles have approved prescription lens carriers. All items have assigned National Stock Numbers and may be purchased through normal supply channels. All optical inserts/carriers for those who wear glasses are available by orders placed at any optometry or ophthalmology clinic, including those in theater.



# Military Combat Eye Protection (MCEP) – Spectacles

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Soldier Survivability



ESS ICE 2



ESS ICE NARO



Oakley SI Ballistic M Frame



Revision Sawfly



Uvex Genesis



Uvex XC

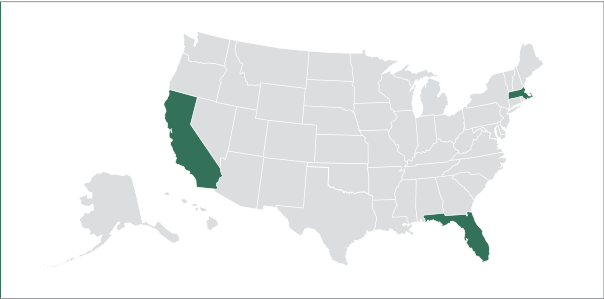


Wiley-X PT-1SC



Wiley-X SG-1

*Provides the Soldier with face, torso, and leg protection from a wide variety of threats during operations.*



**Ballistic and Non-Ballistic Protection** is designed to enhance protection for the Soldiers during a broad spectrum of operations. Items include the following: **Civil Disturbance Protective Gear** provides face, torso, and leg protection from debris, liquids, hand-thrown objects, and direct or indirect fire. Ballistic protection items meet the National Institute of Justice (NIJ) Level IIIA requirements for 9mm and .44 magnum bullet resistance. The **Ballistic Body Shield** is made of Spectra-Shield; **Shin Guards** are made of Kevlar KM2; and **Ballistic Face Shields** are made of acrylic and bullet-resistant polycarbonate materials. **Non-Ballistic Face and Body Shields** are made of transparent polycarbonate materials; non-ballistic shin guards are made of hard plastics. **Knee and Elbow Pads (KEP)** provide dismounted Soldiers with protection for knees and elbows while engaged in tasks that subject these areas to possible injury or discomfort caused by impact, pressure, or protruding objects and debris (e.g., rocks, gravel, or glass).

## Ballistic and Non-Ballistic Protection

Soldier Survivability



**Project Manager Soldier Weapons (PM SW)** supports Soldiers through the development, production, and procurement of future and current weapons systems, ammunition, and associated target acquisition/ fire control products. Soldiers are equipped with the best products industry has to offer, resulting in decisive overmatch capability through increased lethality and range as well as decreased weight. Two Product Managers under PM SW drive the mission: Product Manager Individual Weapons and Product Manager Crew Served Weapons.

In addition to weapons and ammunition, PM SW manages the development and procurement of suppressors, weapons accessory kits, optics, tripods, mounts, and binoculars.

**Project Manager  
Soldier Warrior**

**Project Manager  
Soldier Equipment**


**Project Manager  
Soldier Weapons**

**Product Manager  
Crew Served Weapons**

**Product Manager  
Individual Weapons**

**Soldier-as-a-System  
Unit Set Fielding**





PROJECT MANAGER


# SOLDIER WEAPONS

“The Soldier is the army. No army is better than its Soldiers. The Soldier is also a citizen. In fact, the highest obligation and privilege of citizenship is that of bearing arms for one’s country. Hence it is a proud privilege to be a Soldier—a good Soldier.... To be a good Soldier a man must have discipline, self-respect, pride in his unit and in his country, a high sense of duty and obligation to his comrades and to his superiors, and self-confidence born of demonstrated ability.”

—General George S. Patton, Jr.

**Product Manager Crew Served Weapons (PM CSW)** is responsible for research and development of current and future light to heavy machine guns, grenade launchers, sniper systems, small arms ammunition, remote weapons stations, and related target acquisition/fire control products.



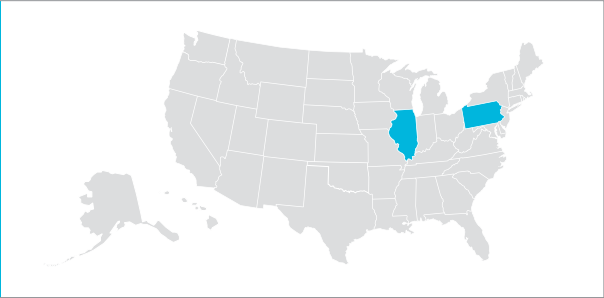


**“The CROWS are working really well in Iraq. Our tanks are rolling multiple missions daily and the tanks with CROWS are seeing a lot of action. This system has added more eyes to see the battlefield... without putting Soldiers’ lives in danger.”**

—Capt. Darren B. Fowler, 2nd Battalion, 12th Cavalry Regiment

# Common Remotely Operated Weapon Station (CROWS)

*Enables Soldiers to acquire and engage targets using a common mounting station while inside an armor-protected vehicle.*



**Common Remotely Operated Weapon Station (CROWS)** is a stabilized mount that contains a sensor suite and fire control software, allowing on-the-move target acquisition and first-burst target engagement. The CROWS sensor suite includes a video camera, thermal camera, and a laser rangefinder, enabling accurate target detection and engagement under day and night conditions. CROWS is designed to mount on any tactical vehicle, and supports the MK19 Grenade Machine Gun, .50 Caliber M2 Machine Gun, M240B Machine Gun, and the M249 Squad Automatic Weapon (SAW). More than 250 systems have been fielded to support Operation Iraqi Freedom (OIF).

## Common Remotely Operated Weapon Station (CROWS)

Crew Served Weapons



*Improves Soldier effectiveness and lethality with a versatile, automatic weapon for offensive and defensive operations, in both ground- and vehicle-mounted roles.*



The **M2 .50 Caliber Machine Gun** is automatic, belt-fed, recoil-operated, and air-cooled. It mounts on the M3 tripod and on most vehicles, and serves as an anti-personnel and anti-aircraft weapon. It is highly effective against light armored vehicles, low- and slow-flying aircraft, and small boats. The M2 provides automatic weapon suppressive fire for offensive and defensive purposes. It is capable of single-shot (ground M2 machine gun) and automatic fire.



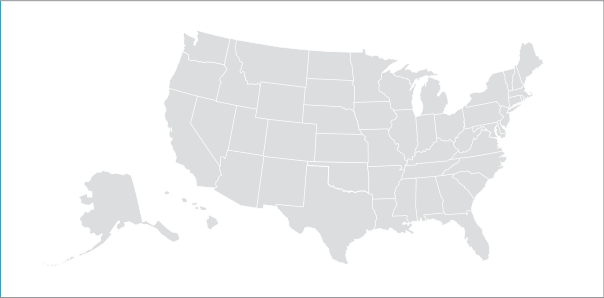
## M2 .50 Caliber Machine Gun

Crew Served Weapons



# M2E2 Quick Change Barrel Kit

*Provides modifications for increased lethality and survivability over the standard M2 Heavy Barrel Machine Gun*



The **M2E2 Quick Change Barrel Kit** is an enhancement to the **.50 Caliber M2 machine gun** offering the Soldier the proven performance and in-place logistics support of the existing M2HB Machine Gun, along with new features and design improvements that make it easier and safer to use. Upgrades such as the Quick Change Barrel (QCB) system, fixed headspace and timing configuration, flash hider, and removable carrying handle will increase the performance of the battle-proven M2 and can be fitted to existing M2HB weapons. The fixed headspace and timing configuration enhancements resolve safety issues with the timing and manual adjustments required to set the original weapon's headspace. The QCB kit on the M2 (to be renamed the M2A1 once type-classified) speeds target engagement and improves survivability and safety by reducing the time required to change the barrel. The flash hider reduces muzzle flash, making the M2 night-vision friendly. The M2E2 Quick Change Barrel Kit ensures that the commander has constant firepower and less downtime.

## M2E2 Quick Change Barrel Kit

Crew Served Weapons



# Lightweight Low-Recoil .50 Caliber Machine Gun

*Provides vehicle and weapon squads with a very lightweight .50 caliber weapon system that is easily dismounted from vehicles for ground mount applications.*



The **Lightweight .50 caliber Machine Gun (LW50MG)** is a Lightweight Variant of the Enhanced .50 caliber Machine Gun. The major benefits of the LW50MG are its low weight and recoil as well as improved reliability, manual safety, barrel life and quick change barrel. The LW50MG is capable of firing all of the current .50 caliber ammunition in the inventory. The LW50MG weapon is designed to augment the current M2 .50 caliber machine gun, but can also be used to replace the M2 in select operational locations that warrant a lightweight .50 caliber machine gun with significant reductions in weight and recoil force. Ideal for light infantry forces, special operations, airborne/airmobile/mountain infantry, as well as for vehicles demanding more lethality but lighter weight, the LW50MG weighs approximately one-half as much as the M2 while significantly reducing the recoil by at least 60%. This lighter weight permits easy dismount and ground transportability when necessary, and the reduced recoil will lead to greater lethality through increased first-burst accuracy and control. Safety will be improved through the elimination of the requirement for the operator to adjust headspace and timing.



## Lightweight Low-Recoil .50 Caliber Machine Gun

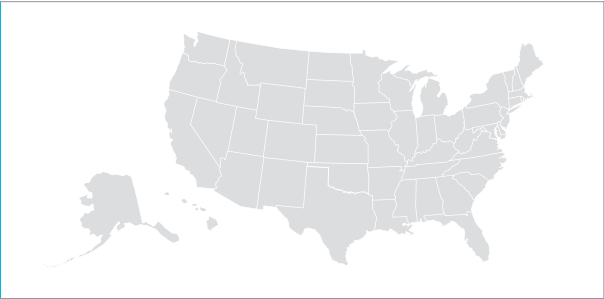
Crew Served Weapons



# XM205 Lightweight Tripod for Heavy Machine Guns

*Provides weapon squads with a lightweight tripod for the dismounted .50 caliber M2 and MK19 grenade machine gun, enabling a quicker, more accurate target engagement.*

The **XM205 Lightweight Tripod for Heavy Machine Guns** is a strong alternative to the current M3 tripod in support of the M2 and MK19 heavy machine guns. The Soldier will experience less weight burden with the XM205 Lightweight Tripod than the standard M3 Tripod (44 pounds), and will be able to take advantage of the enhanced tripod’s integrated traverse and elevation mechanism for quicker, more accurate target engagement.

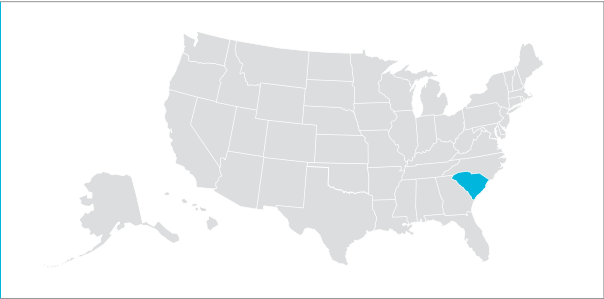




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# M240B 7.62mm Medium Machine Gun

*Provides significantly improved reliability and more lethal medium support fire for ground units such as infantry, armor, field artillery, and combat engineers.*



The **M240B 7.62mm Medium Machine Gun** is a variant of the M240 mounted on Bradley Fighting Vehicles and Abrams tanks; it has been reconfigured for ground applications with buttstock, bipod, iron sights, and forward rail assemblies. The M240B has a maximum effective range of 1,800 meters, a cyclic rate of fire of 650 rounds per minute, and a muzzle velocity of 2,800 feet per second.



## M240B 7.62mm Medium Machine Gun

Crew Served Weapons



*Enhances the capabilities of the M240B Medium Machine Gun by improving mobility, reliability, and survivability.*



The **M240B Short Barrel** reduces the length of the standard M240B barrel by 4 inches and the weight by 1.7 pounds, while maintaining accurate fire at extended ranges. The shorter barrel improves mobility in military operations on urban terrain (MOUT) environments.

The **M240B Collapsible Buttstock** will maintain weapon reliability and improve weapon portability and Soldier survivability. It consists of a completely new in-house design to improve the current standard buttstock. The Collapsible Buttstock will meet the same requirements as the standard buttstock but offer additional capabilities to collapse to various positions without degradation of weapon function.

The **M240B Combat Ammo Pack** enables direct attachment of a lightweight ammunition magazine/container to the M240B Medium Machine Gun. The ammo pack holds 50 rounds of linked 7.62mm ammunition and protects the linked belt from dirt and debris. The ammo pack also allows better movement of the M240B during initial insertions and engagements.



M240B Combat Ammo Pack



M240B Short Barrel

M240B Collapsible Buttstock



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# M240B Weight Reduction Program (M240E6)

*Reduces Soldier combat load by decreasing the weight of the M240B without compromising reliability.*



The **M240B Weight Reduction Program** is intended to reduce the weight of the existing M240B between four pounds (minimum) and seven pounds (objective). This program will evaluate high-performance lightweight materials and alternative manufacturing methods in fabricating major M240B components. These improvements will reduce the Soldier's combat load while allowing easier handling and movement of the weapon.



## M240B Weight Reduction Program (M240E6)

Crew Served Weapons



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# M240H 7.62mm Machine Gun (Aviation Version)

*Improves the self-protection capabilities of Black Hawk and Chinook helicopter crews by replacing the aging M60D Machine Gun.*



The **M240H 7.62mm Machine Gun (Aviation Version)** is designed for aviation but is removable for employment in a ground role. The equipment delivers two minutes of continuous suppressive fire and demonstrates reliability equal to the M240B.



## M240H 7.62mm Machine Gun (Aviation Version)

Crew Served Weapons



# M249 Squad Automatic Weapon (SAW)

*Fulfills the automatic rifle role in infantry squads and provides light machine gun capabilities in combat service/combat service support units.*



The **M249 Squad Automatic Weapon (SAW)** serves as an automatic rifle and light machine gun for infantry squads. The M249 weighs 22 pounds with 200 rounds of ammunition. It replaced the M16A1 Automatic Rifle at the squad level, as well as some M60 multipurpose machine guns in non-infantry units.



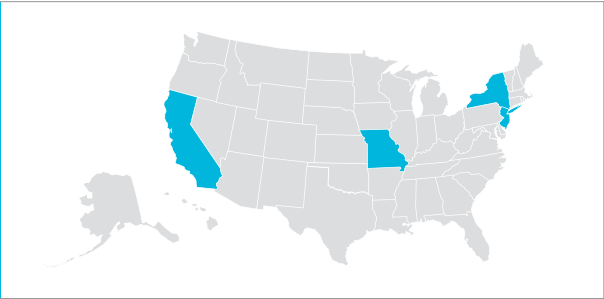
## M249 Squad Automatic Weapon (SAW)

Crew Served Weapons



# M249 Squad Automatic Weapon (SAW) Accessories

*Provides the Soldier using the M249 Squad Automatic Weapon with accessories for enhanced performance.*



The **M249 Squad Automatic Weapon (SAW) Collapsible Buttstock** allows shoulder firing in the extended and collapsed positions. It maintains a vertical buttstock position for full interface with the operator’s shoulder at all times and provides intermediate, locking firing positions. Weapon control improves when fired in confined spaces such as military operations on urban terrain. The buttstock allows ease of ingress/egress from Stryker Brigade Combat Team (SBCT) vehicles and reduces storage space requirements in SBCTs.

The **SAW Improved Bipod** leverages the design of the existing bipod to improve the performance of the M249 weapon, providing the Soldier with increased reliability and weapon accuracy. The bipod legs can be adjusted to different heights, providing improved stability on uneven terrain.

The **M249 200-Round Soft Pack** program is a follow-on effort to the soft packs initially provided under the Rapid Fielding Initiative (RFI). Based on requests from the field, RFI fielded a 200-round soft pack for the M249 designed to improve weapon retention and reduce the noise signature associated with the standard plastic ammunition container. This follow-on program selected a new design pack and resolved all issues identified with the fielded pack. User testing has validated the equipment’s performance. An initial production option was awarded to PTI in Aug 08 for 9,000 M249 200 round Soft Packs. This option fulfilled requirements for the US government to obtain government purpose rights (GPR) for competitive procurement.

**M249 Squad  
Automatic Weapon  
(SAW) Accessories**  
[Crew Served Weapons](#)



SAW Collapsible Buttstock

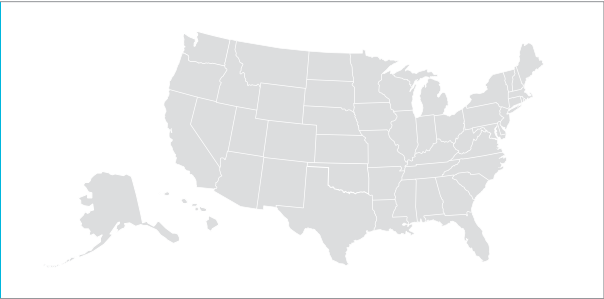


SAW Improved Bipod



M249 200-Round Soft Pack

*Provides a telescopic sight for the M240B Medium Machine Gun and M249 Squad Automatic Weapon light machine gun that enables better target detection, identification, and hit probability.*



The **M145 Machine Gun Optic** (with anti-reflective device) provides machine gunners with the capability to detect, identify, and engage targets at extended ranges. The three-to-four power magnification and wide field of view make this product configurable to mission profiles, operational modes, and environmental conditions. It fits on the M240B for infantry, armored cavalry, special forces, and combat engineer units. In a light machine gun role, it fits on the M249.



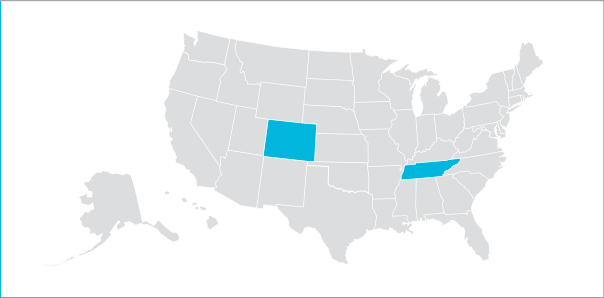
## M145 Machine Gun Optic

Crew Served Weapons



# M192 Lightweight Ground Mount for Machine Guns

*Provides a lightweight, low-profile mounting platform for the M249 Squad Automatic Weapon and M240B Medium Machine Gun for controlled, sustained, and accurate fire at extended ranges.*



The **M192 Lightweight Ground Mount** for Machine Guns is a compact and collapsible low-profile ground mount that provides an integral, unique traverse and elevation mechanism. At 11.5 pounds, it reduces Soldier combat load and improves Soldier mobility.



## M192 Lightweight Ground Mount for Machine Guns

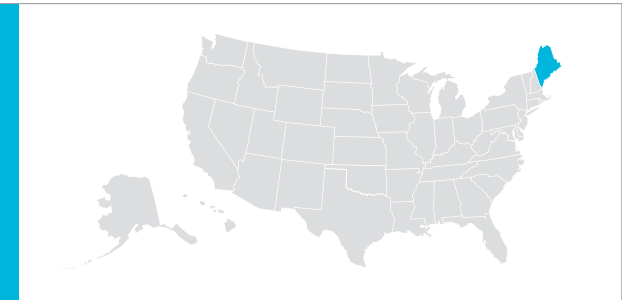
Crew Served Weapons



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# MK19 Grenade Machine Gun

*Provides offensive and defensive Soldier support via a tripod- or vehicle-mounted grenade machine gun.*



The **MK19 Grenade Machine Gun** supports the Soldier in offensive and defensive roles by delivering a heavy volume of close, accurate, and continuous firepower against enemy personnel and lightly armored vehicles. The MK19 can be mounted on a tripod or on multiple vehicle platforms and is the primary suppressive weapon for combat support and combat service support units. The weapon can be used to protect motor movements, assembly areas, and supply trains in bivouac.

The MK19 Grenade Machine Gun can defend against hovering rotary-wing aircraft, destroy lightly armored vehicles, fire on suspected enemy positions, and provide high volumes of fire into an engagement area and indirect fires from hidden positions. The system increases the capability of U.S. forces to defeat opposing armored, mechanized, and infantry forces with high-explosive dual-purpose ammunition. Effective range is 1,500 meters. Maximum range is more than 2,000 meters, with a firing rate of 350 rounds per minute.



## MK19 Grenade Machine Gun

Crew Served Weapons

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# MK19 Tactical Engagement System with GEO-Bearing (TES-GB)

*Enables realistic combat training exercises without using live ammunition.*



The **MK19 Tactical Engagement System with Geo-Bearing (TES-GB)** will be used primarily during Force-on-Force (FOF) and Force-on-Target (FOT) exercises for squad through brigade levels at Combat Training Centers and home stations. The system will simulate the firing and effects of the actual weapon system for line-of-sight direct fire and non-line-of-sight indirect fire.

The TES-GB incorporates communication protocols that operate with existing training equipment and systems to fulfill indirect fire training, communication, recoil and jamming requirements. The system uses the Global Positioning System (GPS) and pointing sensors to calculate and evaluate likely target engagement probabilities. Accuracy is greatly improved with the use of the system’s high-resolution terrain mapping, which uses simulation to effectively train the Soldier how to engage targets shielded by buildings and other barriers.

For direct fire training, the laser module emits visible flash cues and an invisible (infrared) laser beam toward a target. A blue LED Laser Firing Indicator located on the rear of the Laser Module provides signals to the gunner that the laser has fired. A target is outfitted with a detector that senses the laser beam from the Laser Module to cause a target kill or near miss.

The TES-GB consists of a Simulation Player Unit (SPU) that houses a Laser Module, Operator Module, audio cue device (ACD), trigger assembly, RF equipment and associated software. The Operator Module allows the Soldier to review events, and displays ammo type, ammo remaining, and the selected range. The ACD provides realistic sound effects throughout the simulation. The trigger assembly senses the MK-19 firing trigger and alerts the Laser Module and Operator Module to fire the laser.

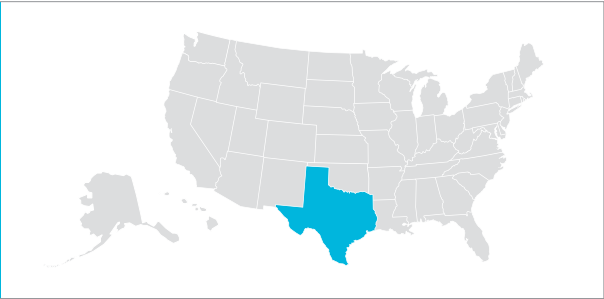
The MK-19 SPU system kit includes alignment targets for performing boresight verification and an interface bracket to mount the ACD on a tripod or pintle mount. Separate support equipment includes a controller gun (CG).

## MK19 Tactical Engagement System with GEO-Bearing (TES-GB)

Crew Served Weapons



*Enhances surveillance and battle image assessment with a compact binocular that fits in the pocket of the Army Combat Uniform.*



**M24 Miniature Binoculars** have 7x optics that deliver brilliantly focused and steady imagery. The equipment offers the same high-quality resolution and magnification as the Army’s Standard M22 Binoculars. However, at 2.68 inches long, 4.92 inches wide, 5.31 inches tall, and only 1.26 pounds, the M24 Miniature Binoculars are 80 percent smaller in size and 50 percent lighter in weight than the M22 Binocular series.



## M24 Miniature Binoculars

Crew Served Weapons



*Enhances surveillance and battle image assessment with high-powered, stabilized binoculars.*



**M25 Stabilized Binoculars** have 14x optics that deliver brilliantly focused and steady imagery regardless of movement. In day mode, the binoculars are direct view optical devices; for nighttime missions the binoculars offer Optional Interchangeable Image Intensifier GEN III eyepieces. The equipment can be hand-held or mounted on a tripod, and can be powered by two AA batteries or vehicle power units via adapter cables. Broadband multi-layer coating on the optics enables greater than 90 percent transmission of light.



## M25 Stabilized Binoculars

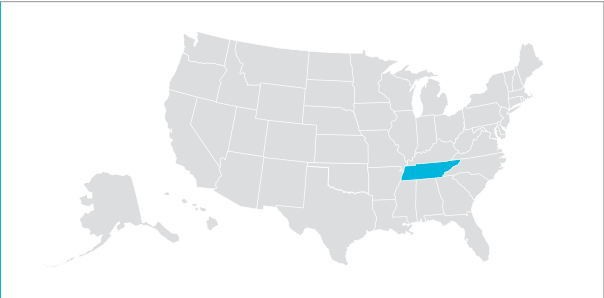
Crew Served Weapons

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# M107 Semi-Automatic Long Range Sniper Rifle (LRSR)

*Enables sniper teams to employ greater destructive force against light materiel and personnel targets at longer ranges and higher rates of fire.*



The **M107 Semi-Automatic Long Range Sniper Rifle (LRSR)** is a commercial, off-the-shelf, anti-materiel and counter-sniper semi-automatic, direct-line-of-sight .50 caliber rifle. Based on the U.S. Marine Corps M82A3 Special Application Scoped Rifle, the M107 Semi-Automatic LRSR greatly exceeds the terminal effect capability of the M24 (7.62mm, bolt-action). The rifle is a valuable resource for the sniper; it enables the precise engagement of high-value targets and provides counter-sniper capability. The M107 Semi-Automatic LRSR is especially valuable during military operations in urban terrain, where the greater firepower and standoff ranges improve sniper survivability.

The rifle is reliable, capable of delivering precise rapid fire on targets out to 2,000 meters. Major components include: rifle with detachable 10-round box magazine; variable-power day optic sight; hard carrying case for storage, transportation, and protection; soft case for tactical operations; bipod; detachable sling; extra magazines; and cleaning/maintenance equipment and manuals. Maximum overall length is 57 inches. Weight with components attached does not exceed 35 pounds. The M107 fires standard .50 caliber ammunition with the MK211 .50 caliber, multipurpose cartridge designated as the primary tactical round.

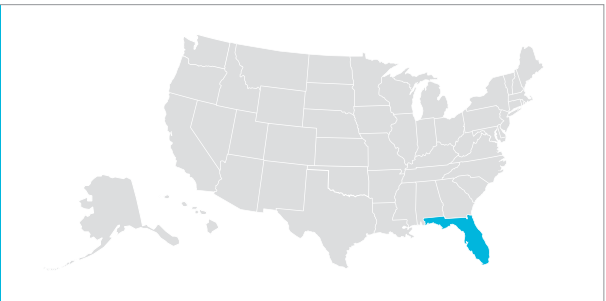
## M107 Semi-Automatic Long Range Sniper Rifle (LRSR)

Crew Served Weapons



# M110 7.62mm Semi-Automatic Sniper System (SASS)

*Supplements the sniper's role to support combat operations with greater firepower, greater versatility and more focused target engagements to improve sniper survivability.*



The **M110 7.62mm Semi-Automatic Sniper System (SASS)** is an anti-personnel and light materiel weapon that fires out to a maximum effective range of 800 meters. It leverages a rapid fire/rapid reload design, variable day optic sight, and 10- and 20-round magazines. The weapon system exceeds the rate of fire and lethality of the M24 Sniper Weapon System. The M110 (combat ready with suppressor) weighs 17.3 pounds and includes a detachable folding bipod, enhanced spotting scope (M151), and a MIL-STD-1913 rail.



## M110 7.62mm Semi-Automatic Sniper System (SASS)

Crew Served Weapons



# M24 Sniper Weapon System (SWS)

*Enables sniper teams to engage enemy personnel with a 7.62mm bolt-action rifle using precision fire at extended ranges.*



The **M24 Sniper Weapon System (SWS)** is a 7.62mm bolt-action, six-shot, repeating rifle, chambered for the .308 Winchester M118 special ball ammunition. Components include a day optic sight with 10 power magnification and adjustable focus, metallic iron sights, deployment kit, cleaning kit (rifle and optic), soft rifle carrying case, optic and system cases, operator’s manual, and an optional bipod.

Associated support equipment includes a Sniper Night Sight and an improved spotting scope. The SWS is a non-developmental item. The combat weight with sling, day optic, and full magazine is 14.25 pounds; 17 pounds with bipod and tools. Maximum effective range is 800 meters, and the length is 40.75 inches.

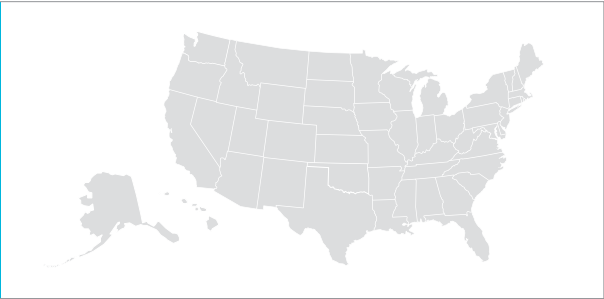
## M24 Sniper Weapon System (SWS)

Crew Served Weapons



# Close Combat Mission Capability Kit (CCMCK) System

*Used by the Soldier to fire 5.56mm (linked/unlinked) Man-Marking ammunition and 9mm Man-Marking ammunition in their assigned weapons during force-on-force training.*



The **M4 Carbine/M16 Rifle Conversion Adapter Kit** is designed for utmost safety, in-service reliability and maintainability. The Conversion Adapter Kit is easy to install, a simple exchange of the Bolt. The Conversion Kit adapts the host weapon to fire unlinked 5.56mm M1042 Man-Marking ammunition with the feel and function of “Live” ammunition. The Conversion Kit is designed and engineered with a Fail-Safe measures to prevent the discharge of a standard “Live” round.

The **M249 Squad Automatic Weapon (SAW)** **Conversion Kit** adapts the host weapon to fire 5.56mm M1071 Linked Man-Marker rounds. The SAW Conversion Kit is also designed and engineered for utmost safety, in-service reliability and maintainability. The Conversion Kit is easy to install with the exchange of the bolt and slide assembly. The SAW conversion kit is expertly engineered with Fail-Safe measures to prevent the discharge of a standard “Live” round.

The **M9 and M11 Pistol Adaptors** are designed for firing 9mm M1041 Man-Marking cartridges. The barrel bore is off center at the muzzle. Both the barrel and slide are unlocked to ensure reliable functioning of the weapon. To compensate for this, in combination with the low muzzle velocity of the projectile, the barrel bore is canted upwards from the chamber to the muzzle to maintain aiming accuracy.

# Close Combat Mission Capability Kit System (CCMCK)

Crew Served Weapons

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M249 Squad Automatic Weapon  
Conversion Kit



M4 Carbine/M16 Rifle Conversion  
Adapter Kit



M9 Pistol Adaptor Kit



M11 Pistol Adaptor Kit



Pistol XM1041

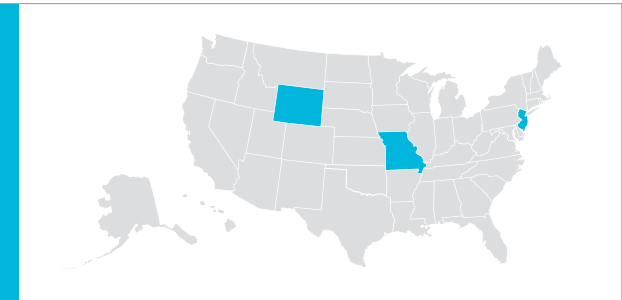
Rifle XM1042



SAW XM1071

# Ammunition Research, Development, Testing, and Evaluation

*Manages the research, development, testing, and evaluation of ammunition products for use in small arms weapon systems.*



**XM1037 Short-Range Training Round for M249:** This ammunition, for use in 5.56mm weapon systems, has a maximum range of 600 meters and an effective training range of 100 meters. It is used with M4, M16, and M249 series weapons with no weapon modification.

**XM1041/XM1042/XM1071 Close Combat Mission Capability Kit:** This commercially available system contains a soft projectile filled with a colored marking compound and weapon modification kits. The soft projectile allows realistic force-on-force training by providing a felt impact signature. The weapon modification kits prevent use of service ammunition in the force-on-force training environment.

**XM1116 12-Gauge Extended Range Less-Than-Lethal Cartridge:** The XM1116 Cartridge is a Soldier Enhancement Program (SEP) that will type-classify a new 12-gauge less-than-lethal cartridge with extended range capabilities. This cartridge will supplement the current suite of less-than-lethal munitions with 5- to 75-meter range capabilities.

**XM1140 40mm Extended Range Less-Than-Lethal Cartridge:** The XM1140 Cartridge is a SEP that will type-classify a new 40mm less-than-lethal cartridge with extended range capabilities, supplementing the current suite of less-than-lethal munitions with range capabilities from five to 75 meters. This cartridge employs a nontoxic agent to mark individuals.

**Lightweight Ammunition:** The lightweight ammunition program will reduce the weight of the 7.62mm ammunition by 20 percent. Testing is under way to explore the use of alternative composite materials and stainless steel in cartridge case production.

**XM1110 40mm Day/Night TP-Cartridge:** This cartridge, fired from M203/M320 Grenade Launchers, is designed to produce an impact signature visible both day and night.

**XM1022 Caliber .50 Sniper Cartridge:** The .50 caliber cartridge offers anti-personnel capability and a non dud-producing training capability to the M107 Long Range Sniper Rifle. The cartridge complements the MK211 cartridge.

**XM1112 40mm Airburst Less-Than-Lethal Cartridge:** The ANLM program will type-classify and field a 40mm low velocity cartridge that utilizes a proximity fuze and provides consistent less-than-lethal and room clearing effects at extended range.

**Micro Electro-Mechanical Safe and Arming Mechanism (MEMS S&A):** The MEMS program will qualify a MEMS S&A with explosive ink deposition technology, and integrate it into the M430A1 and M433 cartridges.

**40mm Close-In Anti-Personnel (CIAP):** The CIAP program will qualify and field a 40mm Close-In Anti-Personnel Cartridge. It will be a low-velocity cartridge, fired from M203 and XM320 grenade launchers. The CIAP will expel multiple projectiles enabling anti-personnel capability at short ranges.

# Ammunition Research, Development, Testing, and Evaluation

Crew Served Weapons

## PROGRAM STATUS

- **XM1037 Short Range Training Round for M16, M4 and M249:** Executing Phase 3 painting and production of test ammunition to be used for formal qualification tests
- **XM1041/XM1042/XM1071 Close Combat Mission Capability Kit:** Qualification testing completed; preparing IPR package for Milestone C and Type Classification approval
- **XM1116 12-Gauge Extended Range Less-Than-Lethal Cartridge:** Contract awarded for test samples
- **XM1140 40mm Extended Range Less-Than-Lethal Cartridge:** Market survey conducted; FCT approved program
- **Lightweight Ammunition:** Initial studies and concept testing completed
- **XM1110 40mm Day/Night TP Cartridge:** Key Performance parameter testing complete validating design for use in formal qualification testing
- **XM1022 Caliber .50 Sniper Category:** Qualification test ongoing
- **XM1112 40mm Airburst Non Lethal Cartridge:** MS B package; task order awarded for design improvements and purchase of long lead items
- **MEMS S&A:** Initiating design for demonstration, qualifying secondary explosive and selecting candidates for primary explosive
- **CIAP:** Characterizing the lethality and probability of hits at various ranges to determine the best sub-projectile configuration

## PROJECTED ACTIVITIES

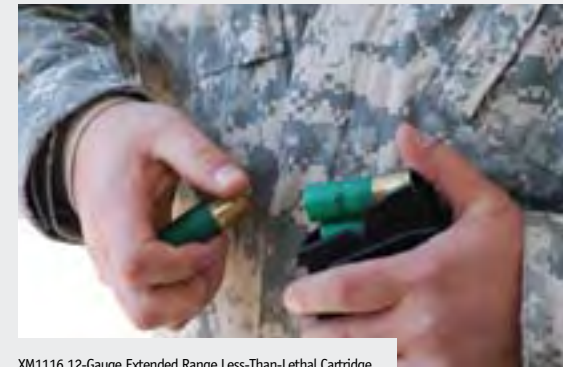
- **XM1037:** Developmental testing
- **XM1041/ XM1042/ XM1071:** Milestone C approval
- **XM1116:** Developmental testing
- **XM1140:** Solicit for test samples
- **Lightweight Ammunition:** Test 7.62mm ball prototypes in M240; complete concept studies for 5.56mm ball and 7.62mm blank rounds
- **XM1110:** System development and demonstration testing
- **XM1022:** Continue qualification testing
- **XM1112:** Complete design improvements from demo version and conduct component-level testing
- **MEMS:** Design demonstration version of M430A1 cartridge, complete qualification of primary explosive, and test candidates for primary explosives
- **CIAP:** Complete baseline of M576



Lightweight Ammunition




XM1110 40mm Day/Night TP-Cartridge



XM1116 12-Gauge Extended Range Less-Than-Lethal Cartridge

**Product Manager Individual Weapons (PM IW)** is responsible for research and development of current and future rifles, carbines, pistols, shotguns, grenade launchers, small arms ammunition, and related target acquisition/fire control products.

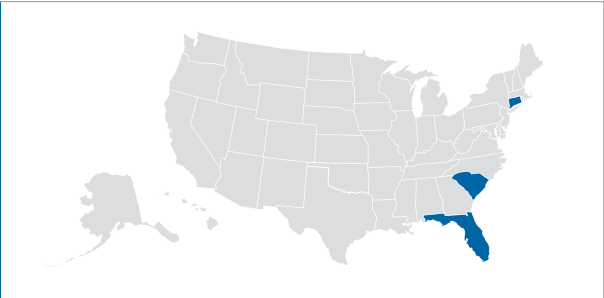




**“My rifle is my favorite piece of equipment. It saves my life. ... It demands a certain level of respect. It’s an M4. ... I think it’s an extraordinary weapon. What else is out there that we can use that is so much better? This thing has been tested. It’s been used for a long, long time. Being proficient and knowing how to use it makes it foolproof.”**

—Sgt. Taylor McLendon, D Company, 1st Battalion,  
66th Armor Regiment

*Increases the lethality and operational flexibility of the Soldier with improvements to the M16A2.*



The fourth-generation M16, the **M16A4 Rifle**, features a performance equal to the M16A2 with enhanced operational flexibility. The M16A4 is a flat top M16A2 that incorporates a MIL-STD 1913 rail integral with the weapon’s upper receiver, and a full-range Back-up Iron Sight (BUIS).

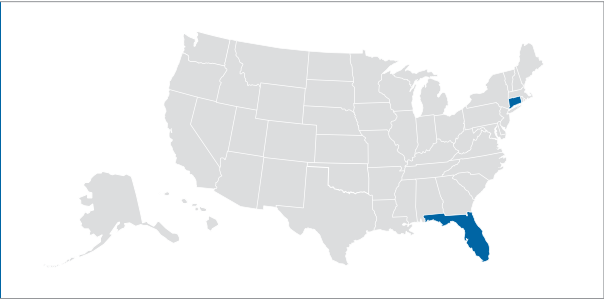
The **M5 Adapter Rail System (ARS)** allows additional MIL-STD 1913 rails to attach mission-specific accessories, to enhance Soldier effectiveness. These accessories can be added or deleted as the mission dictates without the use of special tools. The ARS has been incorporated into standard Army M16A4 configuration.

- Caliber:** 5.56mm x 45mm North Atlantic Treaty Organization
- Weight without magazine:** 7.8 pounds
- Empty 30-round magazine:** 4 ounces
- Loaded 30-round magazine:** 1 pound
- Overall length:** 39.6 inches
- Barrel length:** 20 inches
- Muzzle velocity:** 3,100 feet per second
- Effective range:** 550 meters point targets
- Front sight:** Adjustable front
- Rear sight:** Target sight adjustable for windage and elevation to 600 meters
- Sight radius:** 19.75 inches
- Cyclic rate of fire:** 700-900 rounds per minute
- Fire control selection:** Safe/semi/three-round burst
- Upper receiver:** Flat top with BUIS





*Increases the lethality and operational flexibility of the Soldier with a carbine-length version of the M16 rifle.*



The **M4 Carbine** replaces the M3 Submachine Gun, select M9 Pistols, and M16A2 Rifles for unit leaders, crew served gunners, vehicle crews, radio operators, light infantry, Airborne/Air Assault, and combat engineers. It provides improved firepower and allows mounting of the latest generation of fire control accessories without tools. It is lighter and more portable than the M16 series of rifles. The M4 series of carbines can also be mounted with the M203A2 grenade launcher or M26 Modular Accessory Shotgun System (MASS).

The **M4 Adapter Rail System (ARS)** replaces the hand guards, allowing a Soldier with an M4 Carbine additional Military Standard (MIL-STD) 1913 rails to attach mission-specific accessories to enhance lethality and Soldier effectiveness. These accessories can be added or removed as the mission dictates without the use of special tools. The ARS has been incorporated into the standard Army M4 configuration.

**Caliber:** 5.56mm x 45mm North Atlantic Treaty Organization

**Weight without magazine:** 6.5 pounds

**Empty 30-round magazine:** 4 ounces

**Loaded 30-round magazine:** 1 pound

**Overall Length**

**Buttstock retracted:** 30.57 inches

**Buttstock extended:** 33.82 inches

**Barrel length:** 14.5 inches

**Muzzle velocity:** 2,900 feet per second

**Effective range:** 500 meters point targets

**Front sight:** Adjustable elevation

**Rear sight:** Full range back-up sight adjustable for windage and elevation to 600 meters

**Sight radius:** 14.5 inches

**Cyclic rate of fire:** 700 to 950 rounds per minute

**Fire control selector:** Safe/semi/three-round burst

**Upper receiver:** Flat top with Back-up Iron Sight

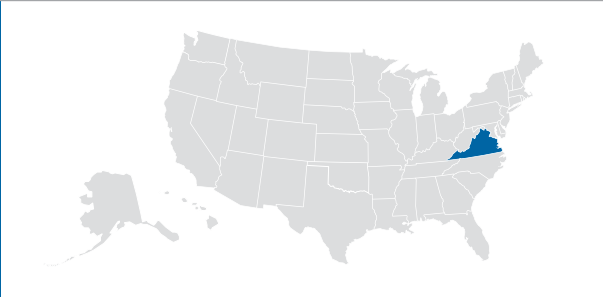


## M4 Carbine

Individual Weapons

# M26 12-Gauge Modular Accessory Shotgun System (MASS)

*Enhances Soldier effectiveness with lethal, less-than-lethal, and door breaching capabilities with a 12-gauge accessory shotgun attachment that provides faster transition time between the primary weapon and shotgun.*



The **M26 12-Gauge Modular Accessory Shotgun System (MASS)** attaches quickly underneath the barrel of the M4 Modular Weapon System (MWS) and fires lethal and less-than-lethal 12-gauge rounds, as well as door breaching ammunition. The MASS provides a capability to transition between lethal and less-than-lethal rounds and is equivalent to a standalone shotgun without having to carry a second weapon.



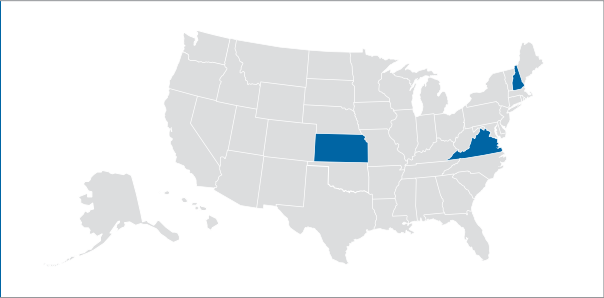
## M26 12-Gauge Modular Accessory Shotgun System (MASS)

Individual Weapons



# XM320 Grenade Launcher Module (GLM)

*Enables the Soldier to accurately engage the enemy in daylight or total darkness with a safer, more reliable grenade launcher that reduces aiming error and increases first-round hit probability.*



The **XM320 Grenade Launcher Module (GLM)** is a 40mm low-velocity grenade launcher weapon module that will replace all Army M203 series grenade launchers. The XM320 GLM improves on the current system with an integral day/night sighting system that provides day/night targeting capability, an open architecture that allows mounting on M16/M4 rifles and carbines, and the ability to convert to a standalone system, enabling an increase in modularity. The XM320 GLM has a side-loading unrestricted breech that allows the system to fire longer 40mm low-velocity projectiles (NATO standard and non-standard) and is more reliable and safer because it uses a more modern double-action trigger/firing system. A handheld laser rangefinder eliminates range estimation, greatly increasing the first-round hit probability of the grenadier.

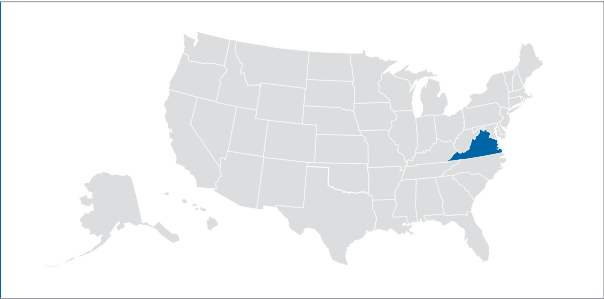


## XM320 Grenade Launcher Module (GLM)

Individual Weapons



*Provides the Soldier armed with an M16 series rifle or M4 Carbine with a robust, precision, electronic optical red dot sight for use with both eyes open to improve effectiveness.*



The **M68 Close Combat Optic (CCO)** is a red dot aiming device that enhances Soldier battlefield situational awareness and target acquisition speed. The sight has no magnification and can be used with all current night vision equipment.

- Length:** 5.3 inches
- Width:** 3.0 inches
- Weight:** 14.4 ounces (M16A4/M4 configuration); 14.1 ounces (M16A2 configuration with auxiliary mounting rail)



## M68 Close Combat Optic

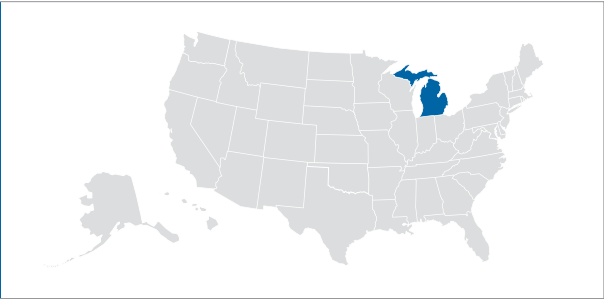
Individual Weapons



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# M150 Rifle Combat Optic (RCO)

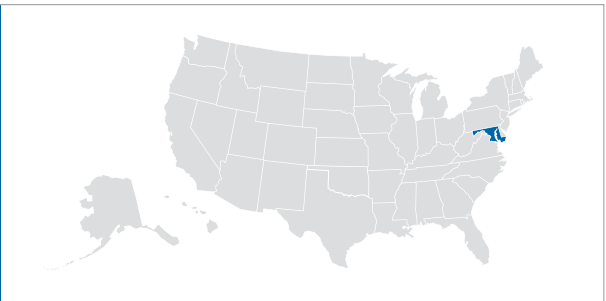
*Provides optical enhancements that increase the probability of a first-round hit at distances of zero to 600 meters.*



The **M150 Rifle Combat Optic (RCO)** will provide an improved capability to recognize and engage targets from 300 to 600 meters with the M4, M16A2, M16A4, and M249 weapons. This optic will not degrade the Soldier's ability to conduct reflexive fire techniques and will allow for the Soldier to transition rapidly between long-range and close quarters engagements. The scope can be used to scan an area. When a target is acquired, the ranging reticle can be used to get an accurate range to the target. The range aiming point on the bullet drop compensator can then be used to engage target.



*Provides the Soldier with a full-range auxiliary rear sight for the M16A4 Rifle and M4 series carbine.*



The M16A4 Rifle and M4 series carbines are flat top weapons with a MIL-STD-1913 accessory mounting rail integral with the upper receiver. The **Back-up Iron Sight (BUIS)** provides an immediately available iron sight capability adjustable to 600 meters range if the primary optical sight becomes inoperative. The BUIS weighs 3.4 ounces.



## Back-up Iron Sight (BUI)

Individual Weapons

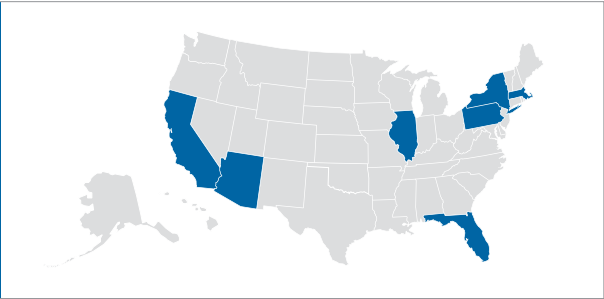
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# Close Quarters Battle Kit (CQB Kit)

*Provides accessories for the M4 Carbine and M16 Rifle that increase Soldier lethality and survivability.*



The **Close Quarters Battle Kit (CQB Kit)** will provide several low-cost, commercial off-the-shelf accessories for the M4 Carbine and M16 Rifle. The need for these items was identified by Soldiers during Operation Enduring Freedom, by the Joint Readiness Training Center Muddy Boots Council, by after-action reports, and by the Rapid Fielding Initiative. The CQB Kit will include the following:

- Multi-Magazine Holder w/Storage Pouch and Dust Cover
- Forward Rail Bracket
- Squad Designated Marksman (SDM) Bipod
- Forward Grip/Bipod
- Improved Cleaning Kit
- Tactical Sling



Tactical Sling



Multi-Magazine Holder

# Close Quarters Battle Kit (CQB Kit)

Individual Weapons



Forward Grip/Bipod



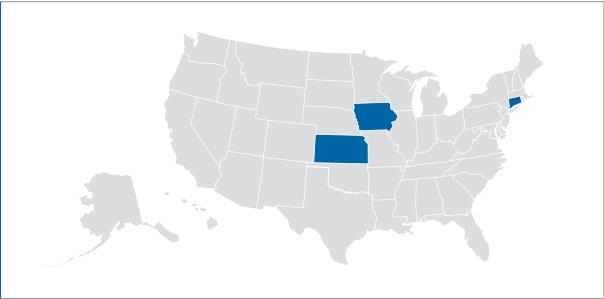
Forward Rail Bracket



Improved Cleaning Kit



*Provides Soldiers with M16 Rifles, M4 Carbines, and M249 Squad Automatic Weapons (SAWs) reliable, quick-change, 30-round capacity ammunition feed equipment.*



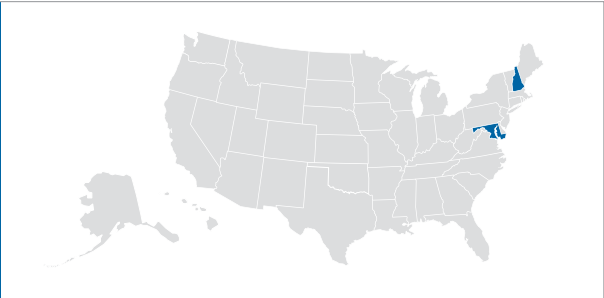
The **M16/M4 Magazine** feeds ammunition to the M16, M4 and M249. The magazines are durable and may be reloaded repeatedly throughout their life cycle.

**Weight Empty:** 4 ounces  
**Weight Loaded:** 1 pound  
**Capacity:** 30 rounds





*Enhances lethality, survivability, and situational awareness in close combat situations via an improved pistol with rail attachment capabilities.*



A semi-automatic, double-action pistol, the **M9 Pistol** is more lethal, lighter, and safer than its predecessors. The M9 is carried by crew served weapon crewmen and by others who have a personal defense requirement, such as law enforcement personnel, unit leaders, and aviators. It replaces the M1911A1 .45 caliber pistol and the .38 caliber revolver.

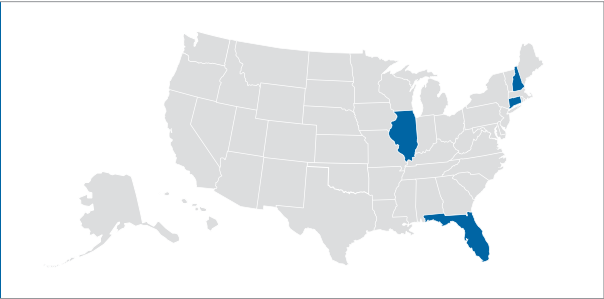
The **M9 Pistol Rail System** will enable the attachment of an Integrated Laser White Light Pointer (ILWLP) to the M9 Pistol, resulting in an increase in lethality and survivability of the Special Forces Soldier or Military Police by providing a tactical advantage in close combat operations. The rail system/ILWLP enhances situational awareness and enables the user to identify or designate targets prior to engaging and to rapidly engage multiple targets.

- Caliber:** 9mm x 19mm North Atlantic Treaty Organization
- Weight:** 33.9 ounces (with empty magazine)
- Weight:** 40.9 ounces (with loaded 15-round magazine)
- Length:** 8.5 inches
- Width:** 1.5 inches
- Height:** 5.5 inches





*Increases the lethality and operational flexibility of the Soldier with a grenade capability that bridges the gap between the hand grenade and mortar.*



The **M203A2** is the latest modification to the M203 40mm **Grenade Launcher**. It provides a mounting system compatible with the M16A4 Rifle and M4 Carbine. The modification includes a quick attach bracket for the grenade launcher and a leaf sight to attach to the Adapter Rail System.

The **M203 Day-Night Sight (DNS)** provides an aiming device for the M203 Grenade Launcher for all lighting conditions, increasing the lethality and operational flexibility of the Soldier. The DNS provides increased accuracy over the current quadrant and leaf sight systems for both point and area targets out to 400 meters. The DNS is equipped with integral iron sights in case of electronics failure or situational expediency.



## M203A2 Grenade Launcher

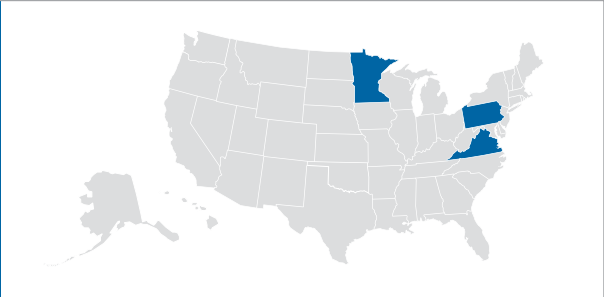
Individual Weapons

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# XM25, Counter Defilade Target Engagement System

*Provides the infantry Soldier with a leap-ahead overmatch capability in a weapon system that will dramatically increase lethality, range, and capability through the use of a family of airbursting ammunition.*



The **XM25, Counter Defilade Target Engagement System** fires 25mm munitions including high-explosive airburst (HEAB), armor-piercing, anti-personnel, less-than-lethal, training, and breaching rounds. The XM25 comes with a target acquisition/fire control (XM104) that integrates thermal capability with direct-view optics, laser rangefinder, compass, fuze setter, ballistic computer, laser pointer and illuminator, and an internal display. The XM25 has a 500-meter point target range and a 700-meter area target range. It is capable of defeating defilade (hidden) targets. The Soldier places the aim point on target and activates the laser rangefinder. The fire control system then provides an adjusted aim point that the Soldier places on the target and pulls the trigger. The range data is communicated to a chambered 25mm round, which speeds down range and at a precisely programmed distance explodes over the target.



## XM25, Counter Defilade Target Engagement System

Individual Weapons



**“Without supplies no army is brave.”**  
—Frederick the Great

**Project Manager**  
**Soldier Warrior**

**Project Manager**  
**Soldier Weapons**

**Project Manager**  
**Soldier Equipment**

**Soldier-as-a-System**  
**Unit Set Fielding**

Planning

Logistic Support

Fielding



# RAPID FIELDING INITIATIVE and SOLDIER-AS-A-SYSTEM UNIT SET FIELDING

Program Executive Office (PEO) Soldier launched the Rapid Fielding Initiative (RFI) in 2002 in response to Soldiers' feedback on equipment needs for ongoing operations. Under the direction of Headquarters, Department of the Army (HQDA), RFI streamlined the process for distributing equipment and ensured that all deploying Soldiers—regular Army, Guard, and Reserve—were outfitted with the most advanced individual and unit equipment available, providing significant improvements to Soldier combat effectiveness, survivability, and operational quality of life. To date, RFI has equipped more than one million deploying Soldiers.

RFI has three closely aligned cells responsible for planning, logistic support, and fielding. The Planning Cell coordinates with HQDA, Forces Command, and other major commands to identify and align the requirements of the Army Force Generation (ARFORGEN) Operational Readiness Cycle. Coordination includes assessing current unit equipping status, forecasting modernization needs, determining specific equipment demands for each fielding event, and informing the Project Managers of procurement needs for the short and long terms. Finally, the Planning Cell identifies units that will gain equipment, coordinates fielding schedules, and secures the necessary support from the units' home installations.

The Logistic Support Cell coordinates the storage, repackaging, and transportation of items, which entails working with vendors and other Army and Department of Defense logistics agencies on shipping and storage. The Logistics Support Cell arranges the delivery of shipments to ensure phased arrival, unloading, and verification in support of the Fielding Cell, which distributes the equipment during fielding events and reports potential shortages to the Logistic Support Cell. In most cases, the Logistic Support Cell arranges immediate shipments before the end of a fielding event, or soon after, to eliminate last-minute equipment deliveries before deployment. If necessary, the Logistic Support Cell transports equipment directly to theater for distribution to the gaining unit. However, this rarely becomes necessary as RFI currently exceeds 99 percent first touch fielding success for the items it distributes.

Because many deploying Soldiers are now on their second or third combat tours, RFI leaders have begun to look at ways to avoid redundancies in equipping Soldiers. As a result, the Lean Fielding concept was put into practice in the third quarter of FY08. Lean Fielding allows Soldiers to decline items already in their possession at the time of fielding, lessening the burden on them to return the duplicate items later. As Lean Fielding is refined, it is expected that significant cost savings will be realized through more accurate projections of equipment demands (in coordination with the various Project Manager offices under PEO Soldier) by reducing procurement and distribution requirements.



## Transformation

The RFI mission, originally scheduled to be completed by the end of FY07, has been extended indefinitely to provide continuing support for the Global War on Terrorism (GWOT). The transition of RFI to Soldier-as-a-System Unit Set Fielding (Saas USF) represents the evolution of RFI to meet Soldier modernization requirements of units preparing for contingency operations, with the fielding schedule dictated by the ARFORGEN Operational Readiness Cycle. The list of equipment distributed to deploying forces is refined and updated based on continuous Soldier feedback from the GWOT experience. Based on that experience, the focus has shifted to consider each Soldier's function and each unit's mission when considering which equipment to field.

As dictated by HQDA, RFI focuses all available resources on equipping the Deployment Expeditionary Forces in the ARFORGEN Ready Pool, and limits distribution of equipment to the remainder of the Operating Army to essential safety and modernization equipment. This distribution process ensures the Army's ability to meet near-term equipping requirements for deploying forces while it implements the ARFORGEN cycle for sustained capabilities over the long term.

SaaS USF will continue to build on the success of RFI, which has driven U.S. industry to substantially increase production of several integral systems, helping our Soldiers meet the intense, near-term demands of the GWOT. Largely because of the RFI program, the turnaround time for getting essential equipment into Soldiers' hands, or from

“warehouse to foxhole,” has been reduced from months or years to days or weeks. The lessons learned will continue to be invaluable in meeting future equipping requirements and strategies. PEO Soldier has a vision for centralized planning, programming, and delivery of the more than 400 items in its portfolio. Centralized planning will be essential as PEO Soldier transforms from a supplemental funding-based resource model to Program Objectives Memorandum (POM)-based support for SaaS USF. Centrally managed resources and fielding of equipment under the purview of PEO Soldier will better support unit ARFORGEN training and readiness requirements. RFI processes are at the vanguard for Army materiel assessment, distribution and Soldier fielding transformation. As we implement ARFORGEN, SaaS USF will be crucial to meeting Soldier equipping requirements as outlined in the Army Campaign Plan (2008). Throughout this process, PEO Soldier remains committed to increasing Soldiers’ combat effectiveness, saving Soldiers’ lives, and improving Soldiers’ quality of life.

Equipping and resetting Soldiers in unit sets, in accordance with the ARFORGEN force pool cycles, will benefit the Army and the industrial base by establishing stable and predictable production requirements to support Army readiness now and for future generations.





# SOLDIER SCIENCE & TECHNOLOGY (S&T)

**PEO Soldier strives to take a proactive role in developing and nurturing our partnership with the S&T community. PEO Soldier G7/Director, Systems Integration, leads this effort. The PEO Soldier S&T portfolio, as summarized herein, includes nearly 150 endorsed and approved projects.**

## **PEO Soldier G7 S&T Functions**

PEO Soldier G7 exercises oversight of S&T policy for PEO Soldier. As part of its duties, G7 develops the appropriate processes, tools, and relationships required for influencing PEO Soldier-related technology development and transition. G7 ensures that S&T initiatives requiring PEO Soldier endorsement are coordinated among appropriate Project Managers, Product Managers, and supporting subject matter experts. Finally, G7 prepares and staffs S&T endorsements, as required, prior to PEO Soldier signature.

Principal sources of Soldier S&T and Technology Transition Investment (Public Sector) include Defense Advanced Research Projects Agency; Army Public-Private Partnerships; University Affiliated Research Centers; Army Technology Objectives (ATO) – Research (**ATO-R**); Army Technology Objectives – Demonstration (**ATO-D**); Army Research Objective - Manufacturing (**ATO-M**); Small Business Innovation Research Program; Defense Acquisition Challenge Program; Technology Transition Initiative Program; Other Mission Funded Programs.

As of the FY09/10 Army Science and Technology Working Group or ASTWG ATO Portfolio review, approximately 29% of the approved Army Technology Objectives are maturing technologies aligned with PEO Soldier technology requirements. Within this portfolio, the most significant investments in PEO Soldier technologies across the Top 10 Warfighter S&T Outcomes are in Battlespace Awareness, Battle Command Network, Force Application, and Force Protection.



# Institute for Soldier Nanotechnology (ISN)

The Institute for Soldier Nanotechnologies (ISN) at the Massachusetts Institute of Technology (MIT) is an interdepartmental research center. The ISN mission is to conduct basic research to advance the state-of-the-art in nanotechnologies as they relate to Soldier protection needs and requirements and to apply the technologies. The ultimate goal is to help the Army create a high-tech battle suit that is lightweight and comfortable. (<http://web.mit.edu/isn/aboutisn/>)

## Nomadics's FIDO™ Explosives Detection System (Amplified Fluorescent Polymer)

Professor Tim Swager's previous work in explosives detection systems was licensed from MIT and commercialized by Nomadics Inc., an Oklahoma-based company working with the ISN. The Fido™ explosives detection system is currently undergoing tests by the U.S. Army and Marine Corps in Iraq and by the U.S. Air Force.



Multiple survivability capabilities enabled by integrated systems of nanotechnologies



FIDO explosive detector



Ultra-Sensitive Explosives Sensing

# Flexible Display Center (FDC)

The Flexible Display Center (FDC) at Arizona State University is an academic, industry, and government collaborative venture designed to advance full-color flexible display technology and flexible display manufacturing to the brink of commercialization. The principal goal of the FDC is to develop high-performance, commercially viable, conformal and flexible displays that are lightweight and rugged, and operate at low power and low cost. (<http://flexdisplay.asu.edu/>)

## December 2006

Cosmetically perfect, high-performance 4-inch diagonal active matrix (AM) QVGA reflective EPD produced on a rigid substrate (silicon). The array was fabricated with FDC's 180° Celcius hydrogenated amorphous silicon (a-Si:H) process designed to be compatible with low-temperature flexible substrates.

## February 2007

America's first flexible 4-inch diagonal AM QVGA reflective (EPD) with a high-performance, low-temperature a-Si:H active matrix transistor array directly fabricated on plastic. The array was fabricated with FDC's 180° Celcius process on DuPont Teijin Film's heat-stabilized polyethylene naphthalate (PEN).

## March 2007

A flexible (de-bonded) solid-state 3.8-inch Quarter Video Graphics Array (QVGA) EPD was demonstrated. FDC technologies integrated in this demonstration include Honeywell planarization material and National Starch temporary bonding adhesive.

## July 2007

The Soldier Flex personal digital assistant integrated a flexible display from the FDC with InHand Electronics Battery Smart software to create a rugged, low-power, ergonomic information device for the Soldier.

## October 2007

General Dynamics C4 Systems demonstrated their Mission Briefer Technology Demonstrator using an electrophoretic display (EPD) fabricated by the FDC.

## Defense Advanced Research Projects Agency (DARPA)

*The Defense Advanced Research Projects Agency (DARPA) is the central research and development organization for the Department of Defense (DoD). It manages and directs selected basic and applied research and development projects for DoD, and pursues research and technology where risk and payoff are both very high and where success may provide dramatic advances for traditional military roles and missions.*  
(<http://www.darpa.mil/>)



The MANTIS program will develop, integrate, and demonstrate a Soldier-worn visualization system, consisting of a head-mounted multispectral sensor suite with a high-resolution display and a high-performance vision processor Application-Specific Integrated Circuit (ASIC), connected to a Soldier-worn power supply and radio. The helmet-mounted MANTIS Vision Processor will provide the Soldier with digitally fused, multispectral video imagery in real time from the Visible/Near Infrared, the Short Wave Infrared, and the Long Wave Infrared helmet-mounted sensors via the high-resolution visor display. The processor adaptively fuses the digital imagery from the multispectral sensors providing the highest


context, best nighttime imagery in real-time under varying battlefield conditions. The system also allows the video imagery to be recorded and played back on demand and allows the overlay of battlefield information. MANTIS will exploit the existing Soldier radio network and provide Soldier-to-Soldier sharing of video clips viewed as picture-in-picture on their helmet-mounted displays. MANTIS will “regain the nighttime advantage” and “exploit the net” to provide the individual Soldier with unprecedented situational awareness.



The Exoskeletons for Human Performance Augmentation program is developing technologies to enhance physical comfort to enable the Soldier, for example, to handle more firepower, wear more ballistic protection, carry larger caliber weapons and more ammunition, and carry supplies greater distances. This will increase the lethality and survivability of ground forces in combat environments, especially for Soldiers fighting in urban terrain. Working with significant interest and technical input from the operational military, including the Army, Marine Corps, and Special Forces, we are exploring systems with varying degrees of sophistication and complexity, ranging from an unpowered mechanical apparatus to full-powered mechanical suits. The program is addressing key technology developments, including energy-efficient actuation schemes and power sources with a relevant operational life, active-control approaches that sense and enhance human motion, biomechanics and human-machine interfaces, and system design and integration.



# Army Technology Objectives





## Technology for Soldier Systems


	Purpose	Results/Products	Payoff
<b>Soldier Protection Technologies ATO-R (Completed FY08)</b>	<p>Provide ballistic and primary blast (lung) protection for individual Soldiers through development of novel fiber technologies, system designs, and analytical tools</p> 	<ul style="list-style-type: none"><li>• Innovative materials for lightweight ballistic protection of Soldiers</li><li>• Prototype integrated protective system with current level of ballistic protection and improved primary blast (lung) protection</li><li>• Extremity body armor system design based on biomechanical model and software-based, expert design and virtual prototyping tool</li></ul>	<ul style="list-style-type: none"><li>• Increased Warfighter survivability against ballistic and blast threats</li><li>• Improved area of coverage for personnel armor that affords maximum flexibility, agility, and mobility</li></ul>
<b>Mounted/Dismounted Soldier Power ATO-R (Completed FY08)</b>	<p>Develop component technologies to power systems for increased mission duration with decreased logistical burden</p>	<p><b>Soldiers</b></p> <ul style="list-style-type: none"><li>• 250 watt man-portable field battery charger and improved rechargeable batteries</li><li>• Hybrid power source (fuel cell and battery)</li><li>• Micro-electronic mechanical systems (MEMS)-based fuel/air delivery, energy reclamation, and cooling components for energy conversion systems</li><li>• Lithium-air (Li-air) battery and improved photovoltaics</li></ul> <p><b>Mobile</b></p> <ul style="list-style-type: none"><li>• Quiet, logistics fueled 1-2 Kilowatt power source</li><li>• 2-5 Kilowatt co-generation system with cooling system fueled by waste heat</li></ul>	<ul style="list-style-type: none"><li>• Provides fuel savings by reducing fuel required for power sources</li><li>• Reduced signature and increased power and energy adds mission capability</li></ul> <p><b>Soldier</b></p> <ul style="list-style-type: none"><li>• Stand-alone man-portable field chargers and improved rechargeable batteries</li><li>• Battery charger electronics</li><li>• Soldier hybrid power sources</li><li>• Improved photovoltaic systems; Li-air batteries</li><li>• Soldier Computer Power Management</li></ul>

	Purpose	Results/Products	Payoff
<b>Biomedical Enablers of Operational Health and Performance ATO-R (Completed FY08)</b>	<p>Enhance Soldier and commander capability to sustain performance across the operational spectrum</p> 	<p>Mission planning tools for:</p> <ul style="list-style-type: none"> <li>• Fatigue intervention and recovery</li> <li>• Water usage</li> <li>• Performance-enhancing nutritional supplements for high-altitude rations</li> </ul>	<p>Improved operational health and performance in:</p> <ul style="list-style-type: none"> <li>• Hot environments</li> <li>• High OPTEMPO operations</li> <li>• High Altitude operations</li> </ul>
<b>Suite of Sense-Through-The-Wall (STTW) Systems ATO-D (Completed FY08)</b>	<p>Provide dismounted and remote users with the capability to detect, locate, and “see” personnel with concealed weapons or concealed explosives (CW/CE) behind obstructions from a standoff distance</p> 	<ul style="list-style-type: none"> <li>• Hand-held, Small Unmanned Ground Vehicle (SUGV) and UGV mounted STTW systems capable of detecting personnel hidden behind obstructions</li> <li>• Suite of hand-held, SUGV and UGV mounted STTW technology demonstrators capable of detecting personnel armed with CW/CE</li> </ul>	<ul style="list-style-type: none"> <li>• Increased force protection and survivability of Soldier in Military Operations on Urban Terrain (MOUT) environments during operations, combat search and rescue, and hostage recovery operations</li> </ul>

# Army Technology Objectives

## Technology for Soldier Systems





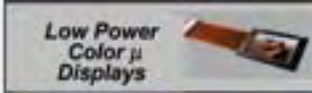


	Purpose	Results/Products	Payoff
<b>Tactical Network and Communications Antennas ATO-D (Completed FY08)</b>	<ul style="list-style-type: none"><li>• Develop affordable, low profile solutions for on-the-move (OTM) Satellite Communications (SATCOM)</li><li>• Develop affordable directional antennas for terrestrial directional networking</li><li>• Develop omni-directional antennas with higher gains, lower profiles with ballistic radomes, and multiple ports to reduce the number of platform antennas</li><li>• Develop integrated antennas for dismounted Soldiers</li><li>• Develop distributed antennas to improve omni-directional antenna performance and reduce cosite interference</li></ul>	<ul style="list-style-type: none"><li>• Low-cost Ku/Ka Band OTM SATCOM Antenna Systems</li><li>• Low-cost X-band point of presence</li><li>• Efficient Ku and Ka band power amplifiers</li><li>• Low-profile single-beam Ku/Ka SATCOM Ant System</li><li>• Low-profile multibeam Ku/Ka/Q SATCOM Ant Analysis</li><li>• Affordable terrestrial directional antennas</li><li>• Wideband network waveform (WNW) high gain omni antennas</li><li>• 2-port low-profile omni antennas with ballistic radome supporting multiple waveforms (Ground/rotary wing)</li><li>• 3-port tri-band omni antennas</li><li>• Integrated body wearable antennas</li><li>• Distributed antenna array</li></ul>	<ul style="list-style-type: none"><li>• Affordable OTM SATCOM and terrestrial directional antennas</li><li>• Reduced visual signatures and antenna counts</li><li>• Improved link connectivity and ballistic protection</li><li>• Reduced platform power consumption</li></ul> 
<b>Nutritionally Optimized First Strike Ration ATO-D (Completed FY08)</b>	<ul style="list-style-type: none"><li>• Optimize Soldier cognitive and physical performance during high-intensity missions by enhancing nutritional status and metabolic fuel availability while minimizing ration weight/cube, food wastage, and source material</li></ul>	<ul style="list-style-type: none"><li>• Decision aid to predict nutritional requirements and First Strike Ration (FSR) components selection</li><li>• Lightweight ration incorporating eat-on-the-move nutrient delivery systems and nutritionally optimized components</li></ul>	<ul style="list-style-type: none"><li>• More deployable, agile and survivable force</li><li>• Improved nutrient delivery, unit cost, and cognitive performance</li><li>• Lighter Soldier load and smaller logistical footprint</li></ul> <div><div>Nutrient Delivery System</div></div>

	Purpose	Results/Products	Payoff
<b>Robotics Collaboration ATO-D (Completed FY08)</b>	<p>Develop the tools, techniques, and autonomy to maximize mounted and dismounted control of ground and air unmanned systems, and to optimize Soldier-robot and robot-robot ground and air teams</p> 	<ul style="list-style-type: none"> <li>• Common scalable interfaces that provide the same look and feel across the spectrum of control devices</li> <li>• Intelligent agent software to adaptively automate and adjust Soldier control tasks</li> <li>• Unmanned vehicles safety operational behavioral algorithms and recommendations for tactics, techniques, and procedures development</li> <li>• Software for unmanned aerial vehicle (UAV) and unmanned ground vehicle (UGV) collaboration</li> <li>• UAV autonomy and cooperative engagement capability</li> </ul>	<ul style="list-style-type: none"> <li>• Increased mission performance through reduction of task timelines, robot interactions, and cognitive burden with increased adaptive automation and collaboration</li> <li>• Reduced Soldier training burden through standardized interfaces</li> <li>• Improved safety of operations around unmanned vehicles</li> <li>• Optimized span of control for unmanned systems</li> <li>• Increased Soldier and system engagement effectiveness</li> </ul>
<b>Low-Cost High-Resolution Infrared (IR) Focal Plane Array (IR FPA) Technologies ATO-R (Completed FY09)</b>	<p>Lower the cost of future high-cost IR sensors by utilizing lower-cost HgCdTe IR focal plane arrays (FPA). Improve performance of low-cost FPAs to enable Soldiers to acquire difficult targets in clutter and longer range identification. Provides capability for wide-area search and long-range ID in the same dewar. Provide capability for smaller pixel, shorter time constant uncooled sensors for new applications</p>	<ul style="list-style-type: none"> <li>• 640x480, 20 um Long Wave Mercury Cadmium Telluride (LW MCT) on silicon substrates for lower-cost cooled high-performance FPAs</li> <li>• Materials and processes to enable shorter time constant uncooled IR sensors and smaller pixel 17 micron uncooled FPAs; 640x480 and 1024x768</li> </ul>	<ul style="list-style-type: none"> <li>• Lower the cost by about a factor of 2 high-performance sensors using MCT on silicon</li> <li>• Increase detection and ID range (~40 percent) with large format, low-cost, high-speed (short time constant) uncooled arrays suitable for Non Line-of-Sight missile seekers, UAVs, and Distributed Aperture Systems</li> <li>• Low-cost upgrades to IR sensors</li> <li>• Large-format, short-time constant uncooled IR FPA enables new capabilities</li> </ul>

# Army Technology Objectives


## Technology for Soldier Systems






	Purpose	Results/Products	Payoff
<b>Tactical Mobile Networks ATO-D (Planned Completion FY09)</b>	<ul style="list-style-type: none"><li>• Develop Soldier Radio Waveform (SRW) for dismounted Soldier and manned and unmanned systems</li><li>• Develop communications and networking technologies that address future force constraints for bandwidth and connectivity while on the move</li></ul>	<ul style="list-style-type: none"><li>• Joint Tactical Radio System (JTRS) Software Communications Architecture (SCA) v2.2 compliant, energy-efficient Soldier Radio Waveform (SRW)</li><li>• Proactive Integrated Link Selection for Network Robustness (PILSNER) Proactive Diverse Link Selection (PAD-LS) algorithms to enhance on-the-move (OTM) connectivity and capacity</li><li>• Faster than real-time dynamic link estimation for connectivity and capacity for Network Management and man-in-the-loop experimentation</li></ul>	<ul style="list-style-type: none"><li>• Energy-efficient voice and data tactical communications for Ground Soldier Systems and sensor-to-shooter linkages</li><li>• Increased OTM connectivity and usable bandwidth</li><li>• Enables commanders to plan communication coverage for OTM course of action</li></ul>

	Purpose	Results/Products	Payoff
<b>Soldier Mobility Vision Systems ATO-D (Planned Completion FY09)</b>	<p>Provide dismounted Soldiers with unprecedented situational awareness (SA), target detection, mobility in all visibility and terrain conditions, and advanced far-target-location (FTL) capability against defilade targets</p> <div><div><p>Low Power LLL Video Sensors</p></div><div><p>Uncooled <math>\mu</math>FLIRs</p></div><div><p>Multi-Spectral Lenses &amp; Coatings</p></div><div></div></div>	<ul style="list-style-type: none"><li>• Family of components suitable for indirect view helmet- and weapon-mounted imaging systems</li><li>• Low power color 1280x1024 Active Matrix Liquid Crystal Display (AMLCD)</li><li>• Compact low-light-level (LLL) image-intensified (<math>I^2</math>) and uncooled infrared (IR) video sensors</li><li>• Custom digital fusion application-specific integrated circuit for lower overall system power consumption</li><li>• Prototype helmet-mounted vision systems, demonstrating low-power digital fusion of 40° field of view visual imaging system (FOV VIS)/near infrared (NIR)/long-wave infrared (LWIR) sensors for indirect viewing</li><li>• Data port for external interfacing</li><li>• Improved innovative microtechnology; handheld advanced far-target-location capability</li></ul>	<ul style="list-style-type: none"><li>• Ability to see and operate when the enemy cannot; compatibility with current aiming devices</li><li>• Improved SA at Soldier level and above, with ability to import and export imagery and data</li><li>• Wider FOV helmet-mounted VIS/NIR and uncooled IR sensors</li><li>• Lower power consumption</li><li>• Accurate and timely far-target-location information against difficult targets in defilade</li></ul> <div><div><p>Low Power Color <math>\mu</math> Displays</p></div><div><p>Multi-sensor Pixel Level, Digital Fusion Processor</p></div><div><p>Far Target Location</p></div></div>

# Army Technology Objectives


## Technology for Soldier Systems


	Purpose	Results/Products	Payoff
<b>Scalable Embedded Training and Mission Rehearsal ATO-D (Planned Completion FY09)</b>	<p>Research, develop, demonstrate, and transition an integrated set of embedded training (ET) and mission rehearsal common components that can be shared by current force combat vehicles and Soldier systems; bridge ET gap between current force and Future Combat System (FCS) by addressing known shortfalls in current force live, virtual and constructive (LVC) ET</p> 	<ul style="list-style-type: none"><li>• Embedded training and mission rehearsal common components that operate on limited footprint of current force systems</li><li>• Vehicle and Soldier user interfaces scaled for ET</li><li>• Demonstrations of ET and mission rehearsal that support a common implementation strategy for the current force</li><li>• Position, location and orientation tactical engagements simulation (TES) devices suitable for embedding on Soldier systems and other equipment</li></ul>	<ul style="list-style-type: none"><li>• Capability supporting common “train as you fight” embedded training implementation across current force combat vehicles and Soldier systems</li><li>• Low-cost, low-power, highly accurate TES devices suitable for embedding in Soldier systems</li></ul>

	Purpose	Results/Products	Payoff
<b>Low-Cost Manufacturing of Materials for Improved Warfighter Protection ATO-M (Planned Completion FY09)</b>	<p>Develop and implement low-cost manufacturing technology to improve processes for current and next-generation helmet shells and multifunctional headgear systems</p> <div> </div>	<ul style="list-style-type: none"><li>• Enable simultaneous processing of ballistic, structural, and multifunctional materials for significantly improved helmet and body armor performance</li><li>• 20–40 percent reduction in touch labor due to net shape preforms</li><li>• 60–70 percent reduction in waste of expensive ballistic fibers</li><li>• Multifunctional materials for novel display technology in helmet material</li></ul> <div> Semi-automatic Thermoplastic Fabrication of Helmet Shells</div> <div> High Molecular Weight Polyethylene Fibers</div> <div> Thermoplastic Carbon Shell Process</div>	<ul style="list-style-type: none"><li>• Increased uniformity of ballistic performance by eliminating differences in fiber geometry and process variability for Advanced Combat Helmet and Ground Soldier System helmets</li><li>• 10–15 percent weight reduction over currently fielded helmet and body armor systems</li><li>• 15–20 percent cost reduction yielded by improved manufacturing processes</li><li>• Flexible process infrastructure to accelerate implementation of improved fibers, lightweight multifunctional materials, and resin systems</li><li>• Multifunctional materials integration enables lightweight head-borne communications systems and sensors integration for Soldier</li></ul>

# Army Technology Objectives




## Technology for Soldier Systems

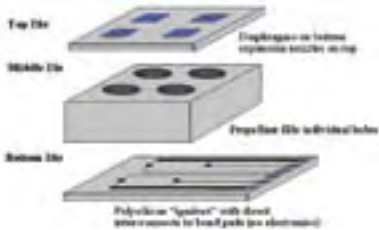

	Purpose	Results/Products	Payoff
<b>Affordable Software Defined Radio (SDR) Components for Joint Tactical Radio System (JTRS) ATO-M (Planned Completion FY09)</b>	<ul style="list-style-type: none"><li>• Provide Future Combat System (FCS) Brigade Combat Team (BCT) with affordable SDR commodities through the Joint Tactical Radio System (JTRS) hand-held, man-pack, small form fit (HMS) acquisition program achieving embedded FCS BCT/JTRS network communications operational availability and affordability goals</li><li>• Achieve size, weight, power consumption, and Universal Product Code (UPC) goals for embedded SDR technology through advanced microelectronics packaging, manufacturing, assembly, test and inspection methods, production processes</li><li>• Maintain production engineering focus on common SDR core transceiver design, reusable across JTRS (vehicle, man-pack, hand-held, small form fit) and scalable FCS BCT platform configurations</li></ul>	<ul style="list-style-type: none"><li>• Manufacturing techniques and processes defined, including validation of efficient qualification test methodology to enable the production of low-cost core transceiver components</li><li>• Modeling and simulation analyses</li><li>• Laboratory demonstrations</li><li>• Low-cost and miniaturized, common core transceiver prototypes</li><li>• Frequency agile radio frequency front end, RF integrated circuit design, energy-efficient power amplifier and wideband tunable filters</li><li>• Low-power, programmable baseband processor</li><li>• Life-cycle cost modeling and simulation analyses supporting FCS BCT and JTRS hand-held, man-pack and small form fit (HMS) cost as an independent variable (CAIV) targets</li></ul> <div data-bbox="865 759 1248 990"></div> <p>JTRS HMS Small Form Fit (SFF) Family</p>	<ul style="list-style-type: none"><li>• Enhanced lethality with sensor-to-shooter seamless network connectivity, interoperable with FCS BCT distributed BCS</li><li>• Improved mobility and operational availability with embedded SDR network communications for JTRS/FCS BCT Soldier and Unmanned Systems</li><li>• Affordable SDR components; achieving JTRS/FCS CAIV goals within life cycle cost objectives of FCS BCT</li></ul>

	Purpose	Results/Products	Payoff
<b>Flexible Display Manufacturing Technology ATO-M (Planned Completion FY09)</b>	<ul style="list-style-type: none"> <li>Develop flexible display manufacturing technologies to enable affordable production of lightweight, rugged, flexible displays</li> <li>Reduce weight with lower ruggedization requirements</li> <li>30 percent to greater than 90 percent reduction in power consumption compared to liquid crystal displays</li> </ul>	<ul style="list-style-type: none"> <li><b>FY05</b> Processes for 1.1 inch (diagonal) test displays</li> <li><b>FY06–07</b> AM manufacturing processes for 4 inch (diagonal) reflective and emissive flexible displays</li> <li><b>FY07–09</b> AM process improvements for 7.5 inch (diagonal) reflective and emissive flexible displays</li> <li>Manufacturing processes will be developed on an integrated pilot-line for limited display quantities and coordinated with S&amp;T program</li> </ul>	<ul style="list-style-type: none"> <li>Information systems for Soldier and vehicle platforms with enhanced situational awareness enabled by rugged, low-power, reduced-volume, low-cost flexible displays</li> <li>Flexible displays will enable novel applications</li> </ul> 
<b>Soldier and Small Unit Modeling ATO-R (Planned Completion FY10)</b>	<p>Provide a user-friendly simulation tool to assess impact and effectiveness of technologies and their physiological effects on Soldiers and small units</p>	<ul style="list-style-type: none"> <li>Enhanced small unit operational effectiveness simulation</li> <li>Soldier and small unit centric algorithms, methodologies and data applicable to other Army models, e.g. Combat XXI and OneSAF</li> </ul>	<ul style="list-style-type: none"> <li>Capability to determine performance effects of technology on Soldiers and small units</li> <li>Transition model releases to Army, Air Force, Navy, Marine Corps, the United Kingdom, Australia, Canada and Netherlands</li> </ul>
<b>Enhanced Performance Personnel Armor Technology ATO-R (Planned Completion FY10)</b>	<p>Provide materials technology and tools to address emerging ballistic and blast threats to head, face, and extremities</p>	<ul style="list-style-type: none"> <li>New materials and concepts for expanded Soldier body armor protection against fragments, blast and bullets</li> <li>Improved materials models for predicting ballistic and blast performance</li> <li>High-fidelity modeling and diagnostic tools to guide technology development</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced ballistic and blast protection, and increased survivability for individual Soldiers</li> <li>Technology and tools transition to advanced technology development efforts in FY10 or earlier as options mature to Technology Readiness Level 5</li> </ul>

# Army Technology Objectives


## Technology for Soldier Systems


	Purpose	Results/Products	Payoff
<b>Compact Radar Technology ATO-R (Planned Completion FY10)</b>	Provide compact radar technology scalable to a variety of ultra-lightweight platforms (less than 10 pounds)	<ul style="list-style-type: none"><li>• Subsystem Technologies:<ul style="list-style-type: none"><li>– Compact electronic scanning antenna</li><li>– Miniaturized, integrated radio frequency front end</li><li>– Ground moving target indicator (GMTI) algorithms with biometrics</li></ul></li><li>• Capability Demonstration:<ul style="list-style-type: none"><li>– Demonstration of networked GMTI target detection and classification in compact, lightweight radar testbed</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Improved situational awareness at Soldier level</li><li>• Biometric algorithms for improved dismount classification</li></ul>
<b>Flexible Display Technology for Soldiers and Vehicles ATO-R (Planned Completion FY10)</b>	Develop flexible display technologies for lightweight, rugged, low-power, and reduced-volume displays that are affordable	<ul style="list-style-type: none"><li>• Demonstrate a flexible, 4-inch diagonal display (&gt;320x240 resolution)</li><li>• Technology for color emissive and reflective displays</li></ul>	<ul style="list-style-type: none"><li>• 60 percent weight reduction of display components compared to glass displays</li><li>• 30 percent to greater than 90 percent power reduction compared to liquid crystal displays</li></ul>
<b>Sensor and Information Fusion for Improved Hostile Fire Situational Awareness ATO-R (Planned Completion FY10)</b>	<p>Provide technology to detect, locate, classify, and identify hostile fire, enabling defeat of the enemy</p> 	<ul style="list-style-type: none"><li>• Enhanced acoustic, ultraviolet (UV), infrared (IR), narrow-band, and/or optical augmentation sensors to detect, locate, and classify small arms, mortars, missiles, rockets, and rocket propelled grenades (RPGs)</li><li>• Signal and image processing and fusion algorithms</li><li>• Ad hoc networking to detect sensors and disseminate threat info to provide situational awareness (SA) across the force</li></ul>	<ul style="list-style-type: none"><li>• Provide combat forces with near real time actionable SA of hostile shooters and gunfire</li></ul> <div></div> <div>Muzzle Flash DetectionHMMWW w/Acoustic Sniper Detection</div>

	Purpose	Results/Products	Payoff
<b>Advanced Lethal Armament Technology Small Arms ATO-R (Planned Completion FY10)</b>	<p>Demonstrate advanced lethal armament component technology for providing improved fragmentation effectiveness to targets</p>  <p>Note: Modeling and Simulations Activities are coincident with efforts</p>	<ul style="list-style-type: none"> <li>• Demonstration of advanced lethality components spiraling to weaponization; includes terminal fragmentation effectiveness trades</li> <li>• Miniaturize proximity electronics for 40mm application; integration of improvement to size, weight, and power of proximity fuze for small arms</li> <li>• Demonstration of technical material components to improve durability, reliability and weight to include Recoil attenuation technical advancement components</li> <li>• Modeling and Simulation assessments integrated with critical technology demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple critical technology demonstrations enabling maturity measurement coupled with cross integration analysis fulfilling broad, small arms capability gaps for spiral transition</li> </ul>
<b>Advanced Fire Control Technologies for Small Arms ATO-R (Planned Completion FY10)</b>	<p>Demonstrate advanced fire control component technology that determines the correct distance to moving targets; enhance power sharing within weapon for current and future warfighters</p> 	<ul style="list-style-type: none"> <li>• Harvest and target, for small arms, the technologies of automatic target detection, and laser steering to increase the Soldier's ability to accurately determine the range to non-cooperative moving targets; improved lethality in direct and indirect fire situations for unsupported firing positions</li> <li>• Investigate weapon wireless net-centric access coincident with power-sharing mounting rails</li> </ul>	<ul style="list-style-type: none"> <li>• Critical technology demonstrations enabling maturity measurement, coupled with cross integration analysis, fulfills broad small arms capability gaps, defilade, and covered targets for spiral transition</li> </ul>

# Army Technology Objectives


## Technology for Soldier Systems



	Purpose	Results/Products	Payoff
<b>Soldier Blast and Ballistic Protective System Assessment and Analysis Tools ATO-D (Planned Completion FY10)</b>	Provide analysis tools and test protocols to aid development and assessment of ballistic and blast protective systems	<ul style="list-style-type: none"><li>• Benchmark of current systems</li><li>• System and component test protocols and devices with initial focus on primary blast lung injury</li><li>• Enhancements to integrated casualty estimation methodology model and analysis for improved Soldier armor design prototypes</li></ul>	<ul style="list-style-type: none"><li>• Improved Soldier armor and blast protection systems</li></ul>
<b>Close Combat Networking of Weapons and Sensors ATO-D (Planned Completion FY10)</b>	Directly and digitally link the close combat weapon system to the tactical network (nonexistent today), enabling networked weapon and target pairing at commander and below	<ul style="list-style-type: none"><li>• Strap-on far-target-locator (FTL) with reduced size, weight, and power and error; on path to embedded smaller form factor for command and launch unit (CLU)</li><li>• Hosted mission software applications</li><li>• Fires mission Joint Variable Message Format (JVMF) messages to Advanced Field Artillery Targeting and Direction System (AFATDS) (call for indirect fires)</li><li>• Self and target Global Positioning System (GPS) position JVMF messages to populate Common Operating Picture (COP)/Force XXI Battle Command, Brigade and Below (FBCB2)</li><li>• Transmit still images</li><li>• Slew to cue (sensor-to-shooter/sensor)</li><li>• Interoperability with Single Channel Ground to Air Radio System (SINCGARS) and Soldier Radio Waveform (SRW)</li></ul>	<ul style="list-style-type: none"><li>• Increased lethality, survivability, and situational awareness</li></ul> <div></div>

	Purpose	Results/Products	Payoff
<b>Lightweight Laser Designator (LD) Modules ATO-M (Planned Completion FY10)</b>	Improve manufacturing process to produce affordable lightweight laser designator modules for small unmanned aerial vehicles (UAV) and unmanned ground vehicles (UGV) platforms and portable Soldier systems	<ul style="list-style-type: none"> <li>• Manufacturable, compact, low-cost laser modules for LD's for UAVs, UGVs and Soldier systems</li> <li>• Prototype laser modules</li> </ul>	<ul style="list-style-type: none"> <li>• Enables LD's for Class I UAV and man-portable light-weight, low-cost LD's</li> <li>• 10x reduction in power use</li> <li>• Reduce laser designator weight by 5x</li> <li>• Improve reliability/reduce maintenance</li> </ul>
<b>Color 1280 x 1024 Micro-Display Manufacturing Technology ATO-M (Planned Completion FY10)</b>	Develop a manufacturing process to provide affordable, high-resolution, full-color micro-display (1-inch format) for insertion into Soldier-borne head mounted image fusion and weapon sight systems	<ul style="list-style-type: none"> <li>• Artifact-free, low-power, high-resolution 1280x1024 Super Extended Graphics Array display for image fusion systems</li> <li>• Stable source of supply for deployment of Army fusion systems</li> <li>• Display format and size that fills gap where flexible and large area displays don't fit</li> </ul>	<ul style="list-style-type: none"> <li>• Increased detection and recognition ranges; increased situational awareness</li> <li>• Enables lower weight displays, increased battery life</li> <li>• Production of 1280 color micro-display on 8" production line reduces cost and enables the Soldier increased mobility, detection, and situational awareness</li> </ul>
<b>Aircrew Survival Technologies ATO-R (Planned Completion FY11)</b>	<p>Reduce aircraft and crew vulnerability to ballistic and crash events for current and future generation Army rotary wing aircraft</p> 	<ul style="list-style-type: none"> <li>• Prototype refined opaque and transparent armor protection systems</li> <li>• Prototype advanced automatic energy attenuators, smart landing gear, advanced inflatable restraint system components, crashworthiness design criteria, and active energy attenuation control</li> <li>• Analytical tools (executable software) required to evaluate material behaviors during ballistic events and high energy impact events</li> </ul>	<ul style="list-style-type: none"> <li>• Increased aircrew and aircraft survivability from conventional threat weapons</li> <li>• Optimal aircrew protection in all survivable crash conditions</li> <li>• Analytical tools supporting design space trades within the ballistic and crashworthiness disciplines</li> </ul>

# Army Technology Objectives


## Technology for Soldier Systems


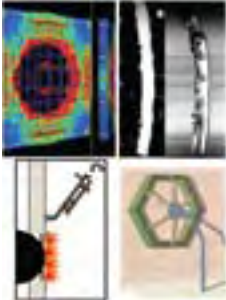
	Purpose	Results/Products	Payoff
<b>Soldier Sensor Component and Image Processing ATO-R (Planned Completion FY11)</b>	<p>Develop the next-generation of digital image-intensified (I<sup>2</sup>) vision components with increased system resolution and dynamic range, as well as reduced network bandwidth and component power</p> 	<ul style="list-style-type: none"><li>• Low-light-level camera and micro-display components with low-power, high-resolution, high-dynamic range digital imaging</li><li>• Compact, low-power digital processor</li><li>• Automatic focus (hands-free) optics</li></ul>	<ul style="list-style-type: none"><li>• Reduced Soldier workload and reaction time in urban operations, with improved resolution of digital vision and improved no-hands focus operation</li><li>• Increase in Soldier urban situational awareness and maneuverability with Soldier-to-Soldier image sharing capability</li></ul>
<b>Soldier and Small Unit Lethality Integration ATO-D (Planned Completion FY11)</b>	<p>Provide small combat unit (SCU) commanders and Soldiers with real-time network fires, planning, collaborative engagement, accurate target location and identification, and target handoff</p>	<ul style="list-style-type: none"><li>• Innovative message processing and decision aid for collaborative target engagement</li><li>• Integrated networked weapon sensors (Smart Sight) with laser rangefinder and digital compass</li><li>• Soldier-integrated gunfire detection sensors (acoustic)</li></ul>	<ul style="list-style-type: none"><li>• Small combat unit Soldiers gain optimal use of lethal, non-lethal, and reachback assets to maximize effects on target</li><li>• Extends to Future Combat System (FCS)/Joint Tactical Radio System (JTRS) Network Line of Sight (LOS)/Non Line of Sight (NLOS) lethality, survivability and situational awareness to tactical edge for SCU assets</li></ul>

	Purpose	Results/Products	Payoff
<b>Power for the Dismounted Soldier ATO-D (Planned Completion FY11)</b>	<p>Provide the Warfighter with small, lightweight power sources that maximize specific energy for core Soldiers, integrated Soldier systems and sensors</p> 	<ul style="list-style-type: none"> <li>• Half-size/2x energy primary C4ISR batteries [e.g. Single Channel Ground to Air Radio System (SINCGARS)]</li> <li>• Conformal rechargeable Soldier system batteries</li> <li>• Soldier mission extending hybrid fuel cell system</li> <li>• Logistic fuel-powered (JP8) Soldier portable power source to enable tactical battery recharging</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in weight and Soldier combat load</li> <li>• Extended mission times in Soldier and sensor applications</li> <li>• Battlefield energy independence</li> <li>• Reduction in re-supply quantity, weight and costs</li> <li>• Power sources and charging technologies that meet Soldier-as-a-System requirements</li> <li>• Increased Soldier mobility, sustainability, survivability and deployability by providing higher energy sources</li> </ul>
<b>Scalable Technology for Adaptive Response ATO-D (Planned Completion FY11)</b>	<p>Provide capability for scalable, selectable, and adaptive lethal effects against platforms and personnel to selectively destroy target function and/or neutralize attributes while limiting damage to surrounding structures and personnel</p> 	<ul style="list-style-type: none"> <li>• Demonstration of agile technologies for scalable, selectable, and adaptive lethal effects in large, medium, and small diameter munitions and missiles</li> <li>• Development of controlled lethal effects, multi-purpose energetics and formulations, reactive materials and advanced fuzing and power technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Improved weapon effectiveness and lethality</li> <li>• Reduced collateral damage</li> <li>• Rapid mission execution with less ammunition expended (reduced logistics)</li> </ul>

# Army Technology Objectives

## Technology for Soldier Systems

	Purpose	Results/Products	Payoff
<b>Advanced Lasers and UAS Payloads ATO-D (Planned Completion FY11)</b>	<ul style="list-style-type: none"><li>Develop multi-function, lightweight laser components and monoblock laser manufacturing processes to enable sensor systems for small unmanned aerial systems (UAS), ground, and Soldier-based applications</li><li>Demonstrate Class I UAS payload that provides laser designation (LD) and eyesafe laser rangefinding (LRF)</li></ul>	<ul style="list-style-type: none"><li>0.25 pound diode pumped monoblock LRF component</li><li>1 pound multifunction (LD/LRF) laser component sized for use with the laser guided Mid Range Munition (MRM) and Precision Attack Munition (PAM)</li><li>7 pound Class I UAS payload with LD/LRF</li><li>Manufacturing process for compact, low-cost, monoblock laser modules key to small payloads</li></ul>	<ul style="list-style-type: none"><li>Small UAS-based LD capabilities organic to lower echelon Warfighters</li><li>Lightweight, multi-function (LD/LRF) laser components to enable future compact UAS, unmanned ground vehicle (UGV) and dismounted Soldier sensor systems</li></ul> 
<b>Target Location/ Designation System (TLDS) ATO-D (Planned Completion FY11)</b>	Provide the Soldier with an improved man-portable, target acquisition, targeting, and laser designation system with reduced size, weight, and power (SWAP)	<ul style="list-style-type: none"><li>Mercury cadmium telluride, midwave infrared focal plane array under constrained cooldown time with a “see spot” capability</li><li>Common designator module utilizing end-pumped mono-block technology as a clip-on device</li><li>Precision target location with improved global positioning, gyroscope, and magnetometer technologies</li><li>Two prototype brass-boards for demonstration</li></ul>	<ul style="list-style-type: none"><li>Lightweight, low-power, high-performance targeting and laser designation technologies</li><li>Increased combat effectiveness, lethality, survivability, and mobility for the Warfighter</li></ul>

	Purpose	Results/Products	Payoff
<b>Mobile Power ATO-R (Planned Completion FY11)</b>	<p>Research, develop, and demonstrate innovative power solutions for tactical mobile power and tri-generation applications</p>	<ul style="list-style-type: none"> <li>• High-end Soldier power: Platoon-level battery charging, multifunction utility/logistics equipment power, exoskeleton; silent watch; unmanned ground vehicles (UGVs)</li> <li>• Universal, adaptable auxiliary power units (APUs) for multiple platforms and standalone power applications</li> <li>• Tri-Gen Tactical Applications providing electrical power, heat and heat-activated cooling</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced fuel consumption leads to force protection</li> <li>• Extended Army power spectrum and mission duration</li> <li>• Enhanced fuel utilization</li> <li>• Reduced operations and support costs</li> <li>• New capabilities enabled</li> </ul>
<b>MOUT/Urban Lethal Technologies ATO-D (Planned Completion FY10)</b>	<p><b>Wall Breacher (WB):</b> Improve the Rapid Wall Breaching Kit (RWBK) by providing a single shot demolition and minimize collateral damage</p> <p><b>Shoulder Fired (SF):</b> Provide a single shoulder-launched munition for the individual Soldier</p>  <p>MOUT Target set</p>	<p><b>WB:</b> Demonstrate state-of-the-art warhead technologies for rapid wall breaching in a single step, reduce time on target and enhance Soldier survivability</p> <p><b>SF:</b> Demonstrate a multipurpose shoulder-fired munition</p>  <p>Advanced Warhead Designs</p>	<p><b>Wall Breacher:</b></p> <ul style="list-style-type: none"> <li>• Improved survivability by reducing time on target</li> <li>• Reduction of overall system weight</li> </ul> <p><b>Shoulder Fired:</b></p> <ul style="list-style-type: none"> <li>• Single shoulder-launched weapon system with increased lethality and survivability for all required targets</li> <li>• Reduced logistics burden and unit training requirements</li> <li>• Decrease Soldier combat load</li> </ul>

# Small Business Innovation Research (SBIR) Program

*The Small Business Innovation Research (SBIR) program allows small, high-tech U.S. businesses (fewer than 500 employees) to provide innovative research and development solutions in response to critical Army needs. By capturing the tremendous and agile talents of the U.S. small business community, the SBIR Program benefits the Department of Defense (DoD), the private sector, and our national economy. (<http://www.armysbir.com>)*

PEO Soldier has endorsed over 100 SBIR topics since 2003. Below topics highlight PEO Soldier participation since 2005 in the Deputy Assistant Secretary of the Army for Research and Technology/Chief Scientist Pilot Program allocating topics each year for PEO management.

## SBIR Phase II (A05-206)

Charles River Analytics Inc.  
“Data Processing and Audio/Visual Displays for Improving Situational Awareness”

## SBIR Phase II (A05-207)

L-3 Communications Nova Engineering Inc.  
Army Commercialization Pilot Program Awardee  
“Handheld Emission Detector”

## SBIR Phase II (A06-199)

Dindl Firearms Manufacturing Inc.  
“Focusing a Thermobaric/High Explosive Blast Wave”

## SBIR Phase II (A06-183)

Prototype Productions Inc.  
“Accessory Rail Communication and Power Transfer”

## SBIR Phase I (A07-182)

Creare Inc. and Systems Technology Inc.  
“Modeling and Simulation Method to Analyze the Aerodynamic Performance of Paratroopers in Military Freefall Operations”

## Active Joint Ventures

### SBIR Phase II Plus (N02-008)

Joint with USN  
“Three-Dimensional (3-D) Anthropometric Data; Apparel Application Methods and Tools”

### SBIR Phase II Co-Fund (N03-162)

Joint with USMC  
“Nonwoven Textile Technologies”



## Defense Acquisition Challenge Program

*The Defense Acquisition Challenge (DAC) provides funds for the test and evaluation of technologies and products with potential to improve current acquisition programs at the component, subsystem, or system level. Any person or activity within or outside the DoD has the opportunity to propose alternatives, known as "Challenge Proposals," which would improve performance, affordability, manufacturability, or operational capability of that acquisition program. These proposals increase the introduction of innovative and cost-saving technology into acquisition programs of the Department of Defense. (<https://cto.acqcenter.com/osd/portal.nsf>)*

### Modular Land Warrior Fuel Cell Power System

**Sponsor:** Army PM Soldier Warrior

**Vendor:** Dupont, Wilmington, DE

This DAC project will test a small, advanced, high-power, lightweight, wearable power source (a direct methanol fuel cell power system) for military operations. The device will have embedded circuitry enabling recharge of batteries during wear. Applications include Soldier-carried electronic systems in radios, navigation systems, hand-held battlefield command and control systems and weapon sensors. Additional benefits include reduction of the Soldier's weight load, longer mission duration and improved Soldier lethality. Testing is by Army Communications Electronics Research, Development and Engineering Center, Ft. Monmouth, NJ.

### Ruggedized Radio Frequency Identification (RFID) Tags with Highly Flexible Antenna

**Sponsor:** PEO Soldier – PM Soldier Warrior

**Vendor:** Vivid Systems, Canton, MS

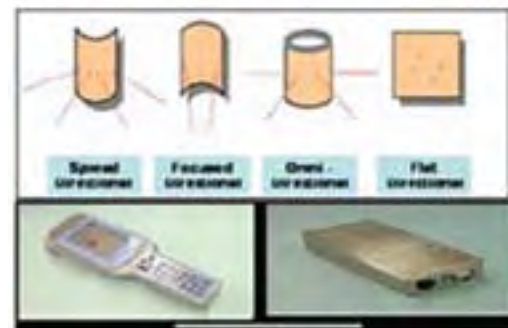
RFID tags with read and write capabilities that are designed for harsh environments and flexible enough to be used on both textiles and metals are to be tested for military use. These tags and their associated reader or writer will be tested and evaluated on the Army M4 modular weapon, AN/PRC-148 Multi-Band Inter/Intra Team Radio, and other Soldier equipment items. These tags are ruggedized data carriers with the capability of rapid reading over long distances and can be exposed to temperature and weather extremes. One type of tag to be tested has a memory lifespan of 10 years and can be rewritten 100,000 times. Testing will be conducted by the Army New Equipment Training Facility, Haymarket, VA.

### Low-cost Land Warrior Cable Connector System

**Sponsor:** Army PEO Soldier, PM Soldier Warrior

**Vendor:** American Competitiveness Institute, Philadelphia, PA

The Land Warrior system is designed to limit fratricide by providing enhanced situational awareness to the Warfighter while adding lethality and force protection. When the injection molded connector shell improvement is implemented, cost for each Land Warrior system will decrease significantly, as will the incidence of fratricide. The injection molding method is more quickly produced and therefore more quickly deployed. Titanium connectors are 40 percent lighter than current connectors manufactured from stainless steel, and they avoid wear from mating and de-mating.





# Glossary

## Acquisition Category (ACAT)

Categories established to facilitate decentralized decision making and execution and compliance with statutorily imposed requirements. The categories determine the level of review, decision authority, and applicable procedures. The ACATs are listed below:

ACAT I programs are Major Defense Acquisition Programs (MDAPs). An MDAP is defined as a program estimated by the Under Secretary of Defense (Acquisition, Technology, and Logistics) (USD (AT&L)) to require eventual expenditure for Research, Development, Test, and Evaluation (RDT&E) of more than \$365 million (Fiscal Year (FY) 2000 constant dollars) or procurement of more than \$2.19 billion (FY 2000 constant dollars), or those designated by the USD (AT&L) to be ACAT I. ACAT I programs have two sub-categories:

The USD (AT&L) designates programs as ACAT ID or ACAT IC.

ACAT ID for which the Milestone Decision Authority (MDA) is USD (AT&L). The D (in ACAT ID) refers to the Defense Acquisition Board (DAB), which advises the USD (AT&L) at major decision points.

ACAT IC for which the MDA is the DoD Component Head or, if delegated, the DoD Component Acquisition Executive (CAE). The C (in ACAT IAC) refers to Component.

ACAT IA programs are Major Automated Information Systems (MAISs) or programs designated by the Assistant Secretary of Defense for Networks and Information Integration (ASD(NII)) to be ACAT IA. An MAIS is an Automated Information System (AIS) program that is:

1. Designated by the ASD(NII) as an MAIS; or
2. Estimated to require program costs in any single year in excess of \$32 million (FY 2000 constant dollars),

total program in excess of \$126 million (FY 2000 constant dollars), or total Life Cycle Costs (LCCs) in excess of \$378 million (FY 2000 constant dollars). MAISs do not include Information Technology (IT) that involves equipment that is an integral part of a weapon system or is an acquisition of services program. ACAT IA programs have two sub-categories:

ACAT IAM for which the MDA is the Chief Information Officer (CIO) of the DoD, the ASD(NII). The M (in ACAT IAM) refers to MAIS.

ACAT IAC for which the DoD CIO has delegated MDA to the CAE or Component CIO. The C (in ACAT IAC) refers to Component.

The ASD(NII) designates programs as ACAT IAM or ACAT IAC.

ACAT II programs are defined as those acquisition programs that do not meet the criteria for an ACAT I program but do meet the criteria for a major system. A major system is defined as a program estimated by the DoD Component Head to require eventual expenditure for RDT&E of more than \$140 million in FY 2000 constant dollars or for procurement of more than \$660 million in FY 2000 constant dollars or those designated by the DoD Component Head to be ACAT II. The MDA is the DoD CAE.

ACAT IIA programs are AIS programs that do not meet the criteria for ACAT IA but are designated by the Army Acquisition Executive (AAE) or Army CIO for Program Manager (PM) management and Army Major Automated Information System Review Council (MAISRC) review. (Army only)

ACAT III programs are defined as those acquisition programs that do not meet the criteria for ACAT I, ACAT IA, or ACAT II programs. The MDA is designated by the CAE and shall be at the lowest appropriate level. This category includes less-than-major AISs.

ACAT IV are programs in the Army not otherwise designated as ACAT I, II, or III. ACAT IV programs are managed by a systems manager within a materiel command, as opposed to ACAT I-III programs, which are managed by a PM.

## Acquisition Phase

All the tasks and activities needed to bring a program to the next major milestone occur during an acquisition phase. Phases provide a logical means of progressively translating B-4 broadly stated mission needs into well-defined system-specific requirements and ultimately into operationally effective, suitable, and survivable systems.

## Advanced Technology Demonstration (ATD)

Used to demonstrate the maturity and potential of advanced technologies for enhanced military operational capability or cost effectiveness, and reduce technical risks and uncertainties at the relatively low costs of informal processes. ATDs are funded with Advanced Technology Development (ATD) funds.

## Advanced Technology Development (ATD)

Budget Activity (BA) 3 within a Research, Development, Test and Evaluation (RDT&E) appropriation account that includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment. ATD also includes Concept and Technology Demonstrations (CTDs) of components and

subsystems or system models. The models may be Form, Fit and Function (F3) prototypes or scaled models that serve the same demonstration purpose. Projects typically have a direct relevance to identified military needs. The result of these type efforts are proof of technological feasibility and assessment of subsystem and component operability and producibility rather than the development of hardware for Service use. Program Elements (PEs) funded under this BA typically involve pre-Milestone B efforts such as system concept demonstrations, joint and Service-specific experiments or technology demonstrations. Advanced Technology Demonstrations are funded with ATD funds. (DoD 7000.14-R)

**Block Approach**

See Evolutionary Acquisition.

**Capability Development Document (CDD)**

A document that captures the information necessary to develop a proposed program(s), normally using an evolutionary acquisition strategy. The CDD outlines an affordable increment of militarily useful, logistically supportable and technically mature capability. The CDD supports a Milestone B decision review. The CDD format is contained in CJCSM 3170.01. (CJCSI 3170.01C and CJCSM 3170.01)

**Capability Production Document (CPD)**

A document that addresses the production elements specific to a single increment of an acquisition program. The CPD must be validated and approved before a Milestone C decision review. The refinement of performance attributes and Key Performance Parameters (KPPs) is the most significant difference between the CDD and CPD. The CPD format is contained in CJCSM 3170.01. (CJCSI 3170.01C and CJCSM 3170.01)

**Commercial and Non-Developmental Items**

Market research and analysis shall be conducted to determine the availability and suitability of existing commercial and non-developmental items prior to the commencement of a development effort, during the development effort, and prior to the preparation of any product description. For ACAT I and IA programs, while few commercial items meet requirements at a system level, numerous commercial components, processes, and practices have application to DoD systems.

**Commercial off-the-Shelf (COTS)**

Commercial items that require no unique government modifications or maintenance over the life cycle of the product to meet the needs of the procuring agency.

**Concept and Technology Development**

Concept and technology development refers to the development of a materiel solution to an identified, validated need. During this phase, the Mission Needs Statement (MNS) is approved, technology issues are considered, and possible alternatives are identified. In this phase, the initiation concept is approved, a lead component is designated, and exit criteria are established. The leader of the concept development team will work with the integrated test team to develop an evaluation strategy that describes how the capabilities will be evaluated once the system is developed. Major components of this phase are Concept Exploration, Decision Review, and Component Advanced Development. Concept Exploration evaluates the feasibility of alternative concepts and assesses the merits of these concepts. This phase ends with a Decision Review, at which the preferred concept for the technologies that are available is selected. The Decision Review may also determine whether additional component development

is necessary before key technologies can enter System Development and Demonstration. Component Advanced Development occurs when the project leader has a concept for the needed capability, but does not yet know the system architecture. The project exits Component Advanced Development when a system architecture has been developed and the component technology has been demonstrated in the relevant environment or the Milestone Decision Authority (MDA) decides to end this effort. This effort is intended to reduce risk on components that have only been demonstrated in a laboratory environment and to determine the appropriate set of subsystems to be integrated into a full system. Concept Decision (CD)

First decision point of the Defense Acquisition Management Framework. It authorizes entry into the Concept Refinement (CR) phase. The principal document at this decision point is the Initial Capabilities Document (ICD) which also contains an approved plan for conducting an Analysis of Alternatives (AoA). A successful CD does not mean that a new acquisition program has been initiated since funding is normally limited to the CR phase which follows. (DoDI 5000.2) See Program Initiation.

**Critical Design Review (CDR)**

A multi-disciplined technical review to ensure that a system can proceed into fabrication, demonstration, and test and can meet stated performance requirements within cost, schedule, risk, and other system constraints. Generally this review assesses the system final design as captured in product specifications for each configuration item in the system's product baseline, and ensures that each configuration item in the product baseline has been captured in the detailed design documentation.

Normally conducted during the System Development and Demonstration (SDD) phase. (Defense Acquisition Guidebook)

### **Design Readiness Review (DRR)**

Provides for a mid-phase assessment of design maturity during the System Development and Demonstration (SDD) phase. According to DODI 5000.2, design maturity may be gauged by the number of subsystem and system design reviews successfully completed; the percentage of drawings completed; planned corrective actions to hardware/software deficiencies; adequate Developmental Testing (DT); an assessment of Environmental, Safety and Occupational Health (ESOH) risks; a completed Failure Modes and Effects Analysis (FMEA); the identification of key system characteristics and critical manufacturing processes; an estimate of system reliability based on demonstrated reliability rates; and other indicators, as appropriate.

### **Developmental Test and Evaluation (DT&E)**

1. Any testing used to assist in the development and maturation of products, product elements, or manufacturing or support processes.
2. Any engineering-type test used to verify status of technical progress, verify that design risks are minimized, substantiate achievement of contract technical performance, and certify readiness for initial Operational Testing (OT). Development tests generally require instrumentation and measurements and are accomplished by engineers, technicians, or Soldier operator-maintainer test personnel in a controlled environment to facilitate failure analysis.

### **DODD 5000.1**

DoD Directive 5000.1, "The Defense Acquisition System."

### **DODI 5000.2**

DoD Instruction 5000.2, "Operation of the Defense Acquisition System."

### **Down Select**

To reduce the number of contractors working on a program by eliminating one or more for the next phase.

### **Engineering Change Proposal (ECP)**

A proposal to the responsible authority recommending that a change to an original item of equipment be considered, and the design or engineering change be incorporated into the article to modify, add to, delete, or supersede original parts.

### **Evolutionary Acquisition (EA)**

The preferred DoD strategy for rapid acquisition of mature technology for the user according to DoDI 5000.2. An evolutionary approach delivers capability in increments, recognizing up front the need for future capability improvements. There are two approaches to achieving an EA: Spiral Development and Incremental Development as noted below:

1. Spiral Development: In this process, a desired capability is identified, but the end-state requirements are not known at program initiation. Requirements are refined through demonstration, risk management and continuous user feedback. Each increment provides the best possible capability, but the requirements for future increments depend on user feedback and technology maturation. According to DoDD 5000.1, spiral development is the preferred process for executing an EA strategy.
2. Incremental Development: In this process, a desired capability is identified, an end-state requirement is

known, and that requirement is met over time by developing several increments, each dependent on available mature technology.

### **First Unit Equipped (FUE) Date**

The scheduled date system or end item and its agreed upon support elements are issued to the designated Initial Operational Capability (IOC) unit and training specified in the new equipment training plan has been accomplished.

### **Fiscal Year (FY)**

For the United States Government (USG), the period covering October 1 to September 30 (12 months).

### **Full Operational Capability (FOC)**

The full attainment of the capability to employ effectively a weapon, item of equipment, or system of approved specific characteristics, which is manned and operated by a trained, equipped, and supported military unit or force.

### **Full Rate Production (FRP)**

Contracting for economic production quantities following stabilization of the system design and validation of the production process.

### **Initial Capabilities Document (ICD)**

Documents the need for a materiel approach to a specific capability gap derived from an initial Analysis of Materiel Approaches (AMA) executed by the operational user and, as required, an independent analysis of materiel alternatives. The ICD defines the gap in terms of the functional area, the relevant range of military operations, desired effects and time. It also summarizes the results of Doctrine, Organization, Training, Materiel,

Leadership, Personnel, and Facilities (DOTMLPF) analysis and describes why nonmaterial changes alone have been judged inadequate in fully providing the capability. (CJCSI 3170.01C)

**Initial Operational Capability (IOC)**

The first attainment of the capability to employ effectively a weapon, item of equipment, or system of approved specific characteristics with the appropriate number, type, and mix of trained and equipped personnel necessary to operate, maintain, and support the system. It is normally defined in the Capability Development Document (CDD) and the Capability Production Document (CPD).

**Initial Operational Test and Evaluation (IOT&E)**

Dedicated Operational Test and Evaluation (OT&E) conducted on production, or production representative articles, to determine whether systems are operationally effective and suitable, and which supports the decision to proceed Beyond Low Rate Initial Production (BLRIP).

**In-Process Review/Interim Program Review (IPR)**

Review of a project or program at critical points to evaluate status and make recommendations to the decision authority.

**Live Fire Test and Evaluation (LFT&E)**

A test process to evaluate the vulnerability and/or lethality aspects of a conventional weapon or conventional weapon system. LFT&E is a statutory requirement (Title 10 U.S.C. § 2366) for covered systems, major munitions programs, missile programs, or product improvements to a covered systems, major munitions programs, or missile programs before they can proceed Beyond Low Rate Initial Production (BLRIP). By law,

a covered system is any vehicle, weapon platform, or conventional weapon system that includes features designed to provide some degree of protection to users in combat and that is an Acquisition Category (ACAT) I or ACAT II program. (Note: The term “covered system” can also be taken to mean any system or program covered by Title 10 U.S.C. § 2366, including major munitions and missile programs.)

**Joint Requirements Oversight Council (JROC)**

Assists the Chairman, Joint Chiefs of Staff (CJCS) in identifying and assessing the priority of joint military requirements (including existing systems and equipment) to meet the National Military Strategy (NMS). The Vice Chairman of the Joint Chiefs of Staff (VCJCS) chairs the Council and decides all matters before the Council. The permanent members include the Vice Chiefs of the U.S. Army (VCSA) and U.S. Air Force (VCSAF), the Vice Chief of Naval Operations (VCNO), and the Assistant Commandant of the Marine Corps (ACMC). The Council directly supports the Defense Acquisition Board (DAB) through the review, validation, and approval of key cost, schedule, and performance parameters at the start of the acquisition process, prior to each milestone review, or as requested by the Under Secretary of Defense (Acquisition, Technology, and Logistics) (USD(AT&L)).

**Low Rate Initial Production (LRIP)**

1. The first effort of the Production and Deployment (P&D) phase. The purpose of this effort is to establish an initial production base for the system, permit an orderly ramp-up sufficient to lead to a smooth transition to Full Rate Production (FRP), and to provide production representative articles for Initial Operational Test and Evaluation (IOT&E) and full-up live fire testing. This effort concludes

with a Full Rate Production Decision Review (FRPDR) to authorize Full Rate Production and Deployment (FRP&D).

2. The minimum number of systems (other than ships and satellites) to provide production representative articles for Operational Test and Evaluation (OT&E), to establish an initial production base, and to permit an orderly increase in the production rate sufficient to lead to Full Rate Production (FRP) upon successful completion of Operational Testing (OT). For Major Defense Acquisition Programs (MDAPs), LRIP quantities in excess of 10 percent of the acquisition objective must be reported in the Selected Acquisition Report (SAR). For ships and satellites LRIP is the minimum quantity and rate that preserves mobilization.

**Materiel Release Order\***

An order issued by an accountable supply system manager (usually an inventory control point or accountable depot or stock point) directing a non-accountable activity (usually a storage site or materiel drop point) within the same supply distribution complex to release and ship materiel.

**Milestone (MS)**

The point at which a recommendation is made and approval sought regarding starting or continuing an acquisition program, i.e., proceeding to the next phase. Milestones established by DoDI 5000.2 are:

MS A approves entry into the Technology Development (TD) phase

MS B approves entry into the System Development and Demonstration (SDD) phase

MS C approves entry into the Production and Deployment (P&D) phase

Also of note are the Concept Decision (CD) that approves entry into the Concept Refinement (CR) phase; the Design Readiness Review (DRR) that ends the System Integration (SI) effort and continues the SDD phase into the System Demonstration (SD) effort; and the Full Rate Production Decision Review (FRPDR) at the end of the Low Rate Initial Production (LRIP) effort of the P&D phase that authorizes Full Rate Production (FRP) and approves deployment of the system to the field or fleet.

### **Milestone Decision Authority (MDA)**

Designated individual with overall responsibility for a program. The MDA shall have the authority to approve entry of an acquisition program into the next phase of the acquisition process and shall be accountable for cost, schedule, and performance reporting to higher authority, including congressional reporting. (DoDD 5000.1)

### **Mission Need Statement (MNS)**

Legacy document. A formatted non-system-specific statement containing operational capability needs and written in broad operational terms. It describes required operational capabilities and constraints to be studied during the Concept Refinement (CR) and Technology Development (TD) phases. MNSs that have initiated staffing in the Joint C4I (Command, Control, Communications, Computers, and Intelligence) Program Assessment Tool (JCPAT) (Knowledge Management/Decision Support (KM/DS) tool) will continue through the normal staffing process, but no new MNSs will be accepted for staffing. Initial Capabilities Documents (ICDs), developed in accordance with CJCSI 3170.01C, will be used instead. Programs that have already

completed Milestone A, or beyond, are not required to update the MNS with an ICD. However, no MNS greater than two years old will be used to support a Milestone A (or Milestone B or C for programs proceeding directly to these milestones) acquisition decision. (CJCSI 3170.01C)

### **New Start**

An item or effort appearing in the President's Budget (PB) for the first time; an item or effort that was previously funded in basic or applied research and is transitioned to Advanced Technology Development (ATD) or engineering development; or an item or effort transitioning into procurement appearing in the PB for the first time in the investment area. Often confused with program initiation, an acquisition term that describes the milestone decision that initiates an acquisition program.

### **Non-Developmental Item (NDI)**

A NDI is any previously developed item of supply used exclusively for government purposes by a Federal Agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement; any item described above that requires only minor modifications or modifications of the type customarily available in the commercial marketplace in order to meet the requirements of the processing department or agency.

### **Off-the-Shelf**

Procurement of existing systems or equipment without a Research, Development, Test and Evaluation (RDT&E) program or with minor development to make system suitable for DoD needs. May be commercial system/equipment or one already in DoD inventory. See Commercial and Non-Developmental Item.

### **Operational Capability**

The measure of the results of the mission, given the condition of the systems during the mission (dependability).

### **Operational Requirements Document (ORD)**

Legacy document. A formatted statement containing performance and related operational performance parameters for the proposed concept or system. ORDs will be accepted for Joint Staff review until late December 2003. After this date, only ORD updates/annexes, Capability Development Documents (CDDs) and Capability Production Documents (CPDs) developed in accordance with CJCSI 3170.01C will be accepted. A validated and approved ORD, developed under CJCSI 3170.01A or CJCSI 3170.01B, may be used to support a Milestone B or Milestone C decision in lieu of a CDD or CPD until late June 2005. See Capability Development Document and Capability Production Document. (CJCSI 3170L.01C)

### **Operational Test and Evaluation (OT&E)**

The field test, under realistic conditions, of any item (or key component) of weapons, equipment, or munitions for the purpose of determining the effectiveness and suitability of the weapons, equipment, or munitions for use in combat by typical military users; and the evaluation of the results of such tests.

### **Operations and Support**

The objective of the Operations and Support phase is the execution of a support program that meets operational support performance requirements and sustainment of systems in the most cost-effective manner throughout their life cycle. The sustainment program includes all elements necessary to maintain the readiness and operational capability of deployed systems. The

scope of support varies among programs but generally includes supply, maintenance, transportation, sustaining engineering, data management, configuration management, manpower, personnel, training, habitability, survivability, safety, IT supportability, and environmental management functions. This activity also includes the execution of operational support plans.

**Preliminary Design Review (PDR)**

A multi-disciplined technical review to ensure that a system is ready to proceed into detailed design and can meet stated performance requirements within cost (program budget), schedule (program schedule), risk, and other system constraints. Generally, this review assesses the system preliminary design as captured in performance specifications for each configuration item in the system (allocated baseline), and ensures that each function in the functional baseline has been allocated to one or more system configuration items. Normally conducted during the System Development and Demonstration (SDD) phase. (Defense Acquisition Guidebook) See Functional Baseline and Allocated Baseline.

**Product Manager (PM)**

The Product Manager is delegated authority and assigned responsibility for centralized management of a development or acquisition program that does not qualify for project management. PM positions are usually at the rank of Lieutenant Colonel or GS-14. Production and Deployment (P&D) phase The fourth phase of the life cycle as defined and established by DoDI 5000.2. This phase consists of two efforts, Low Rate Initial Production (LRIP) and Full Rate Production and Deployment (FRP&D), and begins after a successful Milestone C review. The purpose of this phase is to achieve an operational capability that

satisfies the mission need. LRIP is intended to result in completion of manufacturing development to ensure adequate manufacturing capability and to produce the minimum quantity necessary for initial operational test and evaluation. The Full-Rate Production Decision Review considers the cost estimate, manpower, results of test and evaluation, compliance and interoperability certification. Following the completion of a Full-Rate Production Decision Review, the program enters FRP&D.

**Production Qualification Test (PQT)**

A technical test completed prior to the Full Rate Production (FRP) decision to ensure the effectiveness of the manufacturing process, equipment, and procedures. This testing also serves the purpose of providing data for the independent evaluation required for materiel release so that the evaluator can address the adequacy of the materiel with respect to the stated requirements. These tests are conducted on a number of samples taken at random from the first production lot, and are repeated if the process or design is changed significantly, and when a second or alternative source is brought on line.

**Production Readiness Review (PRR)**

A formal examination of a program to determine if the design is ready for production, production engineering problems have been resolved, and the producer has accomplished adequate planning for the production phase. Normally performed as a series of reviews toward the end of System Development and Demonstration (SDD) phase or early in Production and Deployment (P&D) phase.

**Program Initiation**

The point at which a program formally enters the acquisition process. Under DoDI 5000.2, program initiation normally occurs at Milestone B, but may also occur at other milestones/decision points depending upon technology maturity and risk. At program initiation, a program must be fully funded across the Future Years Defense Program (FYDP) as a result of the Program Objectives Memorandum (POM)/budget process, that is, have an approved resource stream across a typical defense program cycle, for example Fiscal Year (FY) 2006-2011. Concept Refinement (CR) and Technology Development (TD) phases are typically not fully-funded and thus do not constitute program initiation of a new acquisition program in the sense of DoDI 5000.2. This term is often confused with the financial management term new start. See New Start, Concept Refinement, and Technology Development.

**Program Management**

The process whereby a single leader exercises centralized authority and responsibility for planning, organizing, staffing, controlling, and leading the combined efforts of participating/assigned civilian and military personnel and organizations, for the management of a specific defense acquisition program or programs, throughout the system life cycle.

**Qualification**

The formal process by which a manufacturer's product is examined for compliance with the requirements of a source control drawing for the purpose of approving the manufacturer as a source of supply.

### Qualification Test

Simulates defined operational environmental conditions with a predetermined safety factor, the results indicating whether a given design can perform its function within the simulated operational environment of a system.

1. Activities for the development of a new system or to expand the performance of fielded systems.
2. An appropriation.

### Soldier Enhancement Program (SEP)<sup>†</sup>

Approved by Congress in 1989 and revised in 1992 with the aim speeding the “factory to foxhole” process to enhance Soldier lethality, survivability, mobility, command and control, and sustainability with improved weapons and equipment.

### Spiral Development

See Evolutionary Acquisition.

### Sustainment

1. The first effort of the Operations and Support (O&S) phase established and defined by DoDI 5000.2. The purpose of the Sustainment effort is to execute the support program to meet operational support performance requirements and sustain the system in the most cost effective manner over its life cycle. Sustainment includes supply, maintenance, transportation, sustaining engineering, data management, Configuration Management (CM), manpower, personnel, training, habitability, survivability, environment, safety (including explosives safety), occupational health, protection of critical program information, anti-tamper provisions, Information Technology (IT) (including National Security Systems (NSS)), supportability, and

interoperability functions. Sustainment overlaps the Full Rate Production (FRP) and Deployment effort of the Production and Deployment (P&D) phase. (DoDI 5000.2)

2. The provision of personnel, logistic, and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or of the national objective. (CJCSI 3170.01C)

### System Development and Demonstration (SDD)

1. The third phase of the life cycle as defined and established by DoDI 5000.2. This phase consists of two efforts, System Integration (SI) and System Demonstration (SD), and begins after Milestone B. It also contains a Design Readiness Review (DRR) at the conclusion of the SI effort. A successful Milestone B can place the program in either SI or SD. A program planning to proceed into SD at the conclusion of SI will first undergo a DRR to confirm that the program is progressing satisfactorily during the phase.
2. Budget Activity (BA) 5 within a Research, Development, Test and Evaluation (RDT&E) appropriation account. Involves mature system development, integration and demonstration to support Milestone C decisions and the conduct of Live Fire Test and Evaluation (LFT&E) and Initial Operational Test and Evaluation (IOT&E) of production representative articles. A logical progression of program phases and development and production funding must be evident in the Future Years Defense Program (FYDP) consistent with DoD’s full funding policy. (DoD 7000.14-R)

### System Integration

The first effort of the System Development and Demonstration (SDD) phase. A program enters System Integration (SI) when the Program Manager (PM) has a technical solution for the system, but has not yet integrated the subsystems into a complete system. The Capability Development Document (CDD) guides the effort which typically includes demonstration of prototype articles or Engineering Development Models (EDMs). A successful Design Readiness Review (DRR) ends the SI effort. (DoDI 5000.2)

### System of Systems (SoS)

A set or arrangement of interdependent systems that are related or connected to provide a given capability. The loss of any part of the system will degrade the performance or capabilities of the whole. (CJCSI 3170.01C)

### Test and Evaluation (T&E)

Process by which a system or components are exercised and results analyzed to provide performance-related information. The information has many uses including risk identification and risk mitigation and empirical data to validate models and simulations. T&E enables an assessment of the attainment of technical performance, specifications and system maturity to determine whether systems are operationally effective, suitable and survivable for intended use, and/or lethal. There are three distinct types of T&E defined in statute or regulation: Developmental Test and Evaluation (DT&E), Operational Test and Evaluation (OT&E), and Live Fire Test and Evaluation (LFT&E). See Operational Test and Evaluation, Initial Operational Test and Evaluation (IOT&E).

**Type Classification (TC)**

Process that identifies the life cycle status of a materiel system after a production decision by the assignment of a type classification designation. The process records the status of a materiel system as a guide to procurement, authorization, logistical support, asset, and readiness reporting. Satisfies DoD requirement to designate when a system is approved for Service use (Army). Under Secretary of Defense (Acquisition, Technology, and Logistics) (USD (AT&L)); Office of the Under Secretary of Defense (Acquisition, Technology, and Logistics) (OUSD (AT&L)) The OUSD (AT&L) is organized around services, Research and Development (R&D), and materiel acquisition. Several organizational elements report directly to the USD (AT&L) including the Principal Deputy USD (PDUSD (AT&L)), the Director, Defense Research and Engineering (DDR&E), the DUSD (Logistics and Materiel Readiness), and the Director, Ballistic Missile Defense Organization (BMDO). Also, reporting into staff elements within OUSD (AT&L) are a number of Defense agencies such as the Defense Logistics Agency (DLA) and the Defense Advanced Research Projects Agency (DARPA).

All acquisition-related definitions are taken from the Defense Acquisition University (DAU) Glossary. For further information on acquisition-related terminology, see DAU's site at <http://akss.dau.mil/jsp/Glossary.jsp>.

\* Those entries marked with \* derive from the DoD Dictionary of Military Terms,  
<http://www.dtic.mil/doctrine/jel/doddict/>.

† Those marked with the † symbol are adapted from other sources.

# Contractors by State

## Alabama

Alabama Industries for the Blind Inc.  
American Apparel  
American Power Source  
Communications & Ear Protection Inc.  
Huntsville Rehabilitation Foundation  
Science & Engineering Services Inc.  
Westwind Technologies Inc.

## Arizona

ArmorWorks  
Armor Works Ultra Low Profile  
BAE  
Black Diamond Advanced Technology  
GG & G Inc.  
General Dynamics C4S  
Northrop Grumman Electro-Optical  
Systems

## Arkansas

The Glove Corp.

## California

Advanced Countermeasures Systems  
Airborne Systems  
Aqua Lung America Inc.  
Arena Industries  
Armaceel  
Bijan Protective Equipment  
CamelBak-SW Motorsports  
CeraDyne Inc.  
Design West Aratech  
DRS Optronics  
Fire Force Tactical Gear Inc.  
G & M  
Hatch Worldwide Imports  
Intevac Inc.

KDH Defense Systems Inc. (bidding)  
Oakley USA  
Paulson Manufacturing  
Pentagon Lights  
Shotspotter  
Surefire  
Raytheon  
Raytheon Soldiers and Airborne Systems  
Rockwell Collins  
Rockwell Collins Optronics  
Secure Communications Systems Inc.  
Teledyne Imaging Sensors  
Wiley X Eyewear by Protective Optics

## Colorado

Capco Inc.  
Skydex

## Connecticut

Colt Defense  
Colt's Manufacturing Co.  
Interspiro  
Okay Industries Inc.

## Delaware

Masley Enterprises Inc.

## District of Columbia

Federal Prison Industries  
General Services Administration Global  
Supply  
UNICOR

## Florida

American Body Armor  
Bernard Cap Co.  
Coastal Enterprises  
DRS Optronics  
Goodwill Industries  
Grip Pod Systems  
Knight's Armament Co.  
L3 Cyterra  
Northrop Grumman Laser Systems  
Point Blank Body Armor  
Point Blank Solutions Inc. (bidding)  
Protective Materials Company  
Source One Distributors  
SPA NovaTac

## Georgia

Altama Delta Corp.  
Ashland Sales and Service  
Bremen-Bowdon  
Darwood Manufacturing  
Iguana LLC  
Middle Georgia  
Omega Training Group  
Tencate  
Woolrich Inc.  
UNICOR

## Idaho

Eye Safety Systems Inc.

## Illinois

Airtronic Services Inc.  
Belleville Shoe Manufacturing Co.  
Nationwide Glove  
Nationwide Glove Manufacturing  
Norcross Safety Products

Recon Optical Inc.  
Riddell  
Thor Defense Inc.

## Indiana

Raytheon Technical Services Inc.  
UNICOR

## Iowa

Brownell's Inc.  
Hawkeye Glove Manufacturing  
Rockwell Collins

## Kansas

Bushnell Inc.  
Center Industries Corp.

## Kentucky

Ashland Sales/Macon  
Campbellsville Apparel  
Pioneer Vocational Industrial Services  
Shircliff Industries  
Southeastern Kentucky Rehabilitation  
Industries  
UNICOR

## Louisiana

Wellstone Apparel

## Maine

Creative Apparel  
General Dynamics Armament and  
Technical Products  
Group Home Foundation  
Source for Native American Products  
(SNAP)

**Maryland**

Beretta U.S.A. Corp.  
Machining Technologies

**Massachusetts**

BAE Systems  
General Dynamics C4S  
Kopin Corp.  
Michael Bianco Inc.  
Neptune Garment Co.  
Protech Armored Products  
Samson Manufacturing Inc.  
Sterlingwear  
Textron Defense Systems

**Michigan**

Bates Uniform Footwear  
General Dynamics Land Systems  
Peckham Vocational Industries  
Telex Communications Co.  
Trijicon  
Wolverine Worldwide

**Minnesota**

Alliant Techsystems  
Ames True Temper  
DBA Pur/Recovery Engineering  
Katadyn North America Inc.

**Mississippi**

Golden Manufacturing  
Pioneer Aerospace Corp.  
Wellstone Apparel

**Missouri**

Best Tool & Manufacturing Co.  
Eagle Industries  
Lake City Army Ammunition Plant (Alliant  
Techsystems)

**New Hampshire**

Diaphorm  
Insight Technology Inc.  
Saint-Gobain

**New Jersey**

Airborne Systems NA  
Bethel Industries  
Complete Parachute Systems  
Computer Sciences Corp.  
DeRossi and Son Co.  
Harris Manufacturing Co.  
Military Equipment Corp. of America  
Polymer Technologies Inc.  
Savit Corp.  
Sonetronics

**New Mexico**

General Technologies Corp.

**New York**

Allen Vanguard  
Astrocom Electronics Inc.  
Carleton Technologies Inc.  
Defense Technology Corp.  
Hercules Glove Manufacturing Co. Inc.  
Holographic Optics  
Human Technologies Corp.  
Industries for the Blind  
Med-Eng Systems Inc.

NYSARC Inc.  
Otis Products Inc.  
Remington Arms Co. Inc.  
Sam Bonk Uniform Cap Inc.  
Sandina Enterprises  
Telefonics Corp.  
Tennier Industries Inc.  
Tri-Technologies Inc.

**North Carolina**

Federal Covers and Textiles  
Fox Apparel  
General Dynamics Armament & Technical  
Products Inc.  
Inertia First Choice  
MAS (bidding)  
McRae Industries Inc  
Mills Manufacturing Corp.  
MSA Forcefield  
MSA Paraclete  
National Industries for the Blind Inc.  
Patriot Performance Materials Inc.  
Pickett Hosiery Mills  
Special T Hosiery Mills  
TacArm (bidding)  
UNICOR  
Wellco Enterprises Inc.

**Ohio**

Guardian Manufacturing  
Morning Pride Manufacturing  
Rocky Boot  
SSK Industries  
Team Wendy  
Vocational Guidance Services Inc.

**Oklahoma**

GWACS Defense

**Oregon**

Massif Mountain Gear Company

**Pennsylvania**

BAE  
BAE Systems  
Brashear  
Command Arms Accessories  
Fraser-Volpe Corp.  
Gentex  
Gentex Optics Inc.  
Indogem Inc.  
Kongsberg Defense & Aerospace  
MLX Industries Inc.  
Specialty Defense Systems  
Woolrich Inc.

**Rhode Island**

Uvex

**South Carolina**

Fabrique National Manufacturing Inc.  
North Safety Products

**South Dakota**

Aerostar International

**Tennessee**

Barrett Firearms Manufacturing  
Lions Volunteer Blind Industries  
Protective Apparel Corp. of America  
Tennessee Apparel Corp.

Tullahoma Industries  
Universal Technologies Inc.

### **Texas**

BAE Systems  
Benchmark Electronics  
DRS Optronics  
EFW Inc.  
FS Technology  
L-3 Communications  
Northrop Grumman Electro-Optical  
Systems  
Rabintex  
Raytheon  
ReadyOne  
Reyes Industries Inc.  
Sidron Inc.  
Travis Association for the Blind  
UNICOR

### **Utah**

JDLL

### **Vermont**

Revision Eyewear  
Mine Safety Appliances

### **Virginia**

ADS Inc.  
Aerial Machine & Tool Corp.  
Aimpoint Inc.  
Ashbury International Group Inc.  
Capps Shoe Co.  
ECOTAT Systems Co.  
Heckler & Koch Defense  
Industries for the Blind

ITT Industries Night Vision  
Jensen Activewear  
London Bridge Trading Co.  
National Institute for the Severely  
Handicapped Inc.  
National Institute of the Blind  
Planning Systems Inc.  
Vertu Corp.

### **Washington**

Cascade Designs Inc.  
General Dynamics  
National Institute for the Blind  
Seattle Lighthouse for the Blind

### **Wisconsin**

Visions Upholstery  
Weinbrenner Shoe Co.

### **Wyoming**

Defense Technology Corp.

## **International Contractors**

### **Puerto Rico**

API Manufacturing  
Caribbean Needle Point  
DJ Manufacturing  
Kandor Manufacturing  
Propper International  
SNC Manufacturing  
Wear-Tech

### **Canada**

Acton International  
Airboss Defense  
Elcan Optical Technologies  
GD OTS-Canada Inc.  
KDH Defense Systems  
Pacific Safety Products

### **Germany**

GmbH  
NICO

### **Israel**

Elbit Systems Ltd.

### **United Kingdom**

Civil Defense Supply Ltd.  
Qioptiq  
Ultimate Training Munitions, Ltd.



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# PEO Soldier Offices

Program Executive Office Soldier integrates nearly 400 programs, enabling the Soldier to dominate the full spectrum of peace and war, now and in the future. PEO Soldier comprises the following Project Management and special activities offices:

## PROJECT MANAGER SOLDIER WARRIOR

Ft. Belvoir, VA  
**Product Manager Air Warrior**  
 Redstone Arsenal, AL  
**Product Manager Ground Soldier**  
 Ft. Belvoir, VA  
**Product Director Mounted Soldier**  
 Ft. Belvoir, VA

## PROJECT MANAGER SOLDIER EQUIPMENT

Ft. Belvoir, VA  
**Product Manager Clothing and Individual Equipment**  
 Ft. Belvoir, VA  
**Product Manager Soldier Sensors and Lasers**  
 Ft. Belvoir, VA  
**Product Manager Soldier Survivability**  
 Ft. Belvoir, VA

## PROJECT MANAGER SOLDIER WEAPONS

Picatinny Arsenal, NJ  
**Product Manager Crew Served Weapons**  
 Picatinny Arsenal, NJ  
**Product Manager Individual Weapons**  
 Picatinny Arsenal, NJ

## SOLDIER-AS-A-SYSTEM UNIT SET FIELDING

Ft. Belvoir, VA

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